Veterinary Medicine

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Iowa Sees A. V. M. A.'s Greatest Meeting

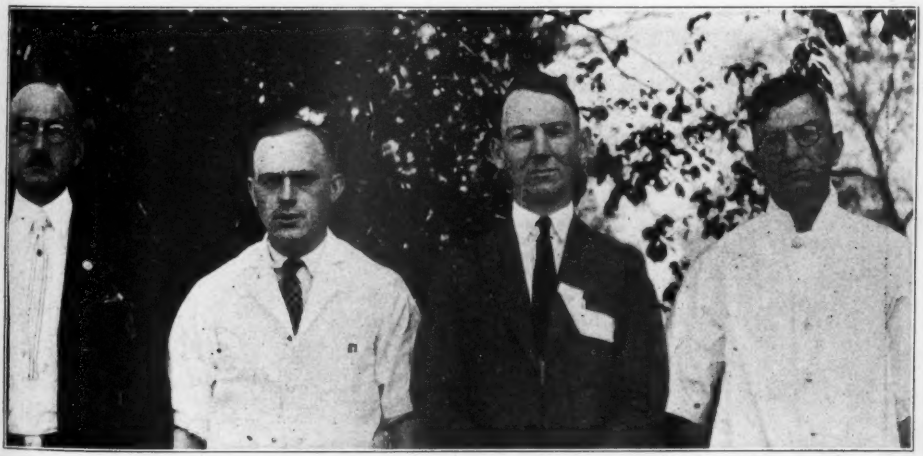
The sixty-first annual meeting of the A. V. M. A., held in Des Moines and Ames, Iowa, August 19-20, in notable respects, broke all records for meetings of that association, just as everyone familiar with what Iowa veterinarians do in their state association expected that it would.

The attendance of men was nearly 900, and the women in attendance numbered approximately 200, thus putting the total attendance well over the thousand mark and exceeding by about 200 the attendance at the New York meeting in 1913, until this meeting the record attendance for the association. The constant attendance at the general and sectional sessions was very exceptional, probably exceeding half the registration of men most of the time, in this respect eclipsing the Chicago meeting of 1909 and far outdistancing any subsequent meeting.

The plans for the meeting were never before carried out so smoothly, nor the proceedings in their entirety so wholly free from objectionable occurrences. The only contests during the meeting grew out of the election of president and the selection of a place for the next meeting. The candidates for president were L. A. Merillat of Ohio, and John W. Adams of Pennsylvania; the vote was 174 for the former and 162 for the latter. No one could feel bad over such a showing. The vice presidents elected in order are: C. D. McGilvray, Ontario; J. N. Gould, Minnesota; J. H. Stanclift (Army), Texas; J. H. McNeil, New Jersey; and I. E. Newsom, Colorado. M. Jacobs of Tennessee, was re-elected treasurer. The place of the next meeting is Portland, Oregon.

Other than the banquet, no social entertainment or sight-seeing was provided for the veterinarians, and this is exactly as it should be. No small part of the success of the meeting in the matter of interest in the program and large attendance at sessions was due to this absence of diversion from the object of the meeting. The entertainment provided for the women was very elaborate and most pleasing to those entertained. The plans for this as published in the August issue of Veterinary Medicine were carried out and some additional features provided.

The adoption of a "policy" for the association was important, if succeeding administrations carry it out, and was a good start even if it



Left to right: Dr. T. H. Ferguson, Dr. Guy Fincham, Dr. H. E. Bemis, Dr. C. W. Deming. Four prominent clinicians at the Ames clinic.

Left to right: Dr. Geo. McNutt, Dr. Wm. Aitken, Dr. W. W. Dimock, Dr. C. D. Rice, Dr. Benj. Zupp, Dr. H. S. Murphey. All six assisted in the notable clinic at Ames.

goes no further. We reprint it for the information of non-members, for it now for the time being, at least, becomes the official policy of the veterinary profession of America and is a good creed to strive to live up to. Its diction could be decidedly improved by editing, but it probably does not need an interpreter, except where it says the association "should render assistance in the enactment of all legislation affecting the public's interest," it probably means "desirable legislation" instead of all legislation proposed, a majority of which is unnecessary, and a further considerable portion, inimical to public welfare. This clause will probably be further restricted to apply to proposed legislation in which veterinarians may properly take an interest as such, and not to proposed legislation in which all good citizens may properly interest themselves.

Contrary to the usual custom in similar associations the resolutions of the committee on necrology were received by the members sitting; the flag behind the speaker's desk was displayed with the wrong side to the fore and the women's program was referred to in the official program as the "Ladies" program.

Left to right: Lieut. Col. Luis A. Beltran and Col. John H. Gould, V. C., U. S. A. (retired). Dr. Beltran is a graduate of the University of Pennsylvania and senior officer of the veterinary corps of the Cuban Army.

The feature of the meeting, the high point of interest, was the clinic. When the meeting was assembled for the clinic at Ames on the fourth day of the meeting, it was announced that by actual count 738 veterinarians were present in the room, and 200 women in attendance at the meeting were being entertained on other parts of the campus of the Iowa State College.

The clinic was in charge of Professor H. E. Bemis, of the college. The forenoon was given over to a discussion of the clinical subjects by the clinicians before the whole assembly and to such demonstrations as could readily be given on the stage of the meat laboratory of the college where the meeting was held.

Following a free lunch given by the local committee, the clinic was continued in the various buildings of the veterinary department. During the afternoon the clinicians performed the operations and gave the demonstrations discussed during the forenoon. As the clinic was divided into thirteen sections held simultaneously, the opportunity for observing what was being done was good even with the large number present.

Those on the committees on arrangement and program and entertainment and clinic, and all Iowa veterinarians, have reason to be very proud of the success of the meeting. President Stange has much cause for satisfaction in having set a mark for future presidents to strive to attain. We surmise it will not be attained soon.

A Proposed Policy for the A. V. M. A.

The members of the American Veterinary Medical Association and others interested in the profession often have need of an expression of the opinions, policies and principles of the Association. They wish to know where it stands on matters affecting various interests and what approval, support or opposition may be expected from it for any program affecting the relation of the veterinarian to the public welfare.

It is apparent that this profession is in the midst of an evolutionary period destined to bring about a material change in its relation to economics of modern life. The American Veterinary Medical Association must ever serve the interests of the public, as well as those of the profession. The trend of modern events demands a capable readjustment of her activities in keeping with other organizations.

In order to avoid misunderstandings, to assist in the passage of wise legislation, recommendations and regulations, to encourage high professional ideals, and to furnish wise counsel and guidance, it is believed that the Association should have and support a definite policy with reference to any subject that may assume importance to the members of the profession.

The Association, therefore, assumes the position of endorsing a definite policy setting forth its purpose and containing recommendations pertaining to the important subjects of agricultural extension, veterinary education, legislation, public health, allied organizations, publicity, regulatory service, veterinary biologics, humane measures and preventive medicine.

Dr. E. R. Steele and Dr. W. F. Guard with the Hell Maria.

The purposes of the American Veterinary Medical Association are to promote and protect the interests of the veterinary profession; to raise the requirements of veterinary education; to procure the enactment of uniform laws and regulations governing the control of animal diseases; to carry out the enforcement of these laws and regulations; to encourage public opinion through various means regarding problems of animal hygiene; and to promote good fellowship in the profession.

Agricultural Extension

Agricultural extension has for its basic object the promotion and improvement of all

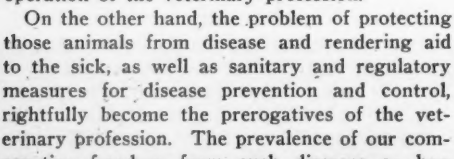
Left to right: Dr. C. H. Covault, Dr. J. C. Flynn, Dr. J. G. Horning. These are the canine specialists. The small animal clinic attracted more attention than any other section of the Ames clinic. A tribute to the interest in the subject or skill and popularity of the clinicians or both.

Left to right: Dr. J. A. Kiernan and Dr. J. A. Barger. Dr. Kiernan heads the forces battling bovine tuberculosis in the U. S. and Dr. Barger heads the same forces for Iowa. Both first won their spurs in tick eradication.

phases of agricultural activities. The live stock industry is a most important integral part of agriculture; thus agricultural extension service comes into close touch and relationship with the veterinary profession. Each has a definite and proper sphere of activity; and encroachment of one upon the prerogatives of the other will work disaster.

The limitations of the agricultural extension service may be very properly classified as strictly educational and promotive in character. The work of promotion in the development of better live stock is a part of the proper field of activity of the agricultural extension service, and to this work should be given the hearty cooperation of the veterinary profession.

On the other hand, the problem of protecting those animals from disease and rendering aid to the sick, as well as sanitary and regulatory measures for disease prevention and control, rightfully become the prerogatives of the veterinary profession. The prevalence of our comparative freedom from such diseases as hog cholera, anthrax, blackleg and tuberculosis will depend largely on the character of the support given to our profession by the agricultural extension service.



Left to right: Dr. Ward Giltner, Dr. W. E. Cotton, Dr. M. F. Barnes, Dr. H. P. Hoskins, members Abortion Committee, U. S. Live Stock Sanitary Association. Dr. C. P. Fitch, the remaining member of the committee, is also in this picture, but like the cost of the salesman's overcoat, he can't be seen.

The Association should:

1. Support every effort of the Agricultural Extension Service to increase the production of a better class of live stock, particularly urging the exclusive use of pure-bred, registered sires of good type and conformation and lend every assistance to the establishment of pure-bred herds and flocks.

2. Emphasize the value of sanitary surroundings for animals, the value of proper nutrition and the advantages of orderly marketing.

3. Encourage the establishment of calf, pig, sheep, colt, poultry, corn and other agricultural clubs among the boys and girls.

4. Encourage the promotion of racing, endurance tests and better live stock shows.

5. Co-operate with the various agricultural extension agencies for the betterment of agriculture and the live stock industry.

6. Make provision for a representative of this Association to attend each annual conference of Agricultural Extension Directors.

7. The Association should maintain a correct relationship with all the important pure-bred live stock associations, working with them for the improvement of live stock and the control of transmissible diseases.

8. Veterinarians affiliated with agricultural colleges and agricultural extension services should confine the instruction and advice given to agricultural students and live stock owners on veterinary subjects to:

(a) The fundamental principles of live stock sanitation;

(b) First aid, and

(c) The value of employing competent veterinary services in the diagnosis, prevention and treatment of animal diseases.

Veterinary Education

The standard and quality of a veterinary college is dependent upon the ability of its teaching staff, its entrance requirements, the ability of its student body and the perfection of its physical equipment and clinical facilities. The character of service that the college may render and from which its value to the live stock industry may be estimated is directly reflected by the graduates of the institution. If the profession is to rise to the highest point of service to the live stock industry, preliminary education in subjects directly allied to veterinary medicine must be stressed, while membership in the various veterinary medical associations and post-

Left to right: Dr. H. E. Biester, Dr. Chas. Murray, Dr. Chris Juhl, Dr. George Young. More stars at the Ames clinic.

graduate work for keeping up-to-date are essential.

States contemplating the establishment of veterinary education are advised to provide scholarships for prospective students that will enable them to attend recognized and qualified institutions already established in other states.

Undergraduate veterinary education should be conducted only at institutions approved by the American Veterinary Medical Association.

Faculties of the different colleges in the United States and Canada should correlate their schedules and curricula so that a student may transfer from one college to another with a minimum loss of time and credit.

Legislation

All ills cannot be cured by legislation; much still depends on individual effort through the rendering of efficient service, whether private or public. The Association offers a word of caution against over-legislation. The Association should render assistance in the enactment of all legislation affecting the public's interests.

The Association has a Committee on Legislation, the activities of which have been confined almost entirely to national problems. This Committee should be continued and means be provided so that its activities may be extended to provincial, state and local conditions.

Regulatory Service

No laws or regulations will succeed in controlling diseases of animals unless veterinarians and owners of live stock are sufficiently interested and familiar with them to assist in such control.

Government control of animal diseases has extended so that those actively engaged in any branch of the veterinary profession have of necessity dealings with state, provincial and federal authorities. In order to promote a better understanding between private practitioners and regulatory officials and to permit greater freedom of individual effort, it is advisable that the following principles be observed:

(1) This Association recognizes the right of the states and provinces to employ veterinarians for the purpose of giving free professional service for the control of communicable diseases. It does not approve of the state or province denying any class of qualified veterinarians the right to render such service. The word "service" as used here refers to the actual performance of routine work, such as the application of diagnostic methods, treatment, etc., and does not refer to administrative regulatory service.

Left to right: Dr. W. H. Welch, Dr. S. Brenton, Dr. A. J. Savage. These old timers enjoyed immensely watching the meeting go by.

Left to right: Dr. A. Eichhorn, Dr. C. E. Cotton, Dr. T. E. Munce, Dr. O. E. Dyson. These are deep ones, sort of veterinary Mat Quays, Bill Stones, Bois Penroses and Mark Hannas, to take no chances with living bosses.

(2) When state, provincial and federal governments authorize the work of any duly qualified class of veterinarians who have met state, provincial and federal requirements, there should be no discriminatory regulation against their services. When indemnities are paid to owners for animals slaughtered because of infectious diseases, such indemnities should not be limited to animals condemned only by veterinarians regularly employed by the federal, state, county or provincial governments, but should be paid when such animals are disclosed as a result of a diagnosis of any qualified veterinarian authorized by the state or province, provided state or provincial and federal regulations governing the same are complied with.

(3) It is the opinion of this Association that the general use of special county, state, federal or provincial employes for the performance of routine work, like tuberculin testing, where animal husbandry is developed and qualified private practitioners are established, is not a wise permanent policy in the control of animal disease.

Left to right: Dr. E. A. Benbrook, Dr. H. B. Raffensperger, Dr. E. M. Nighbert. These are the parasitologists alias bug hunters. Ben hunts 'em in dogs and other animals, Raff specializes in pigs, and Nigh in sheep.

Public Health

This Association recognizes the well established facts concerning the transmissibility of certain diseases of animals to human beings. The veterinarian should continue to render every possible service to health officials by supplying information with reference to animal diseases.

The relation of the veterinary profession to public health is important. The function of the veterinary profession is twofold. First, to protect the health of animals, thus rendering their products salable and safe for human consumption. Second, to safeguard public health by the control of animal diseases transmissible to man, and by the inspection of animal food products.

The veterinary profession should commit itself to the policy of promoting the use of healthy animals and healthful animal products. This Association commends and encourages the consumption of milk and milk food products from tuberculosis-free herds.

Allied Organizations

The term "allied organizations" refers to all associations and societies actively interested in the problems of agriculture, live stock improvement, and public health. The veterinary profession through its membership should be identified with those organizations and participate in their deliberations whenever practicable, make provision for a representative of this Association to attend the annual conference of allied organizations and invite representatives of such organizations to attend the annual convention of this Association.

The Committee on Policy of this Association should confer with the Committee on Policy of the United States Live Stock Sanitary Association, in an endeavor to harmonize policies and activities that may be of mutual interest and benefit.

Publicity

The scientific and learned professions have been among the last groups to avail themselves of channels of publicity and have adopted such means to a less extent than other interests have done.

The policy of this Association should be to promote and carry on ethical publicity, calculated to improve the service of the veterinary profession.

Humane Measures

1. Probably no more useful service has been rendered mankind than that which has

Luncheon on the college campus, Ames, for the women. Nearly three hundred sat at tables under these fine old campus trees. Of course Ames provided the finest of weather for this luncheon.

been accomplished through animal experimentation. The advancements in bacteriology and physiology have been brought about mainly through such experimentation. Without the knowledge which has been gained in these two subjects, veterinary as well as human medicine would have been greatly handicapped.

2. This Association should support humane measures and assist in teaching and guiding the public mind in correct methods of handling animals humanely.

Veterinary Biologics

1. It appears desirable that this Association establish, in co-operation with the Federal Bureau of Animal Industry and producers of veterinary biological products, a classification of veterinary biologics, whereby the veterinary practitioner may be guided and the live stock industry protected.

2. It is recognized by this Association that in the diagnosis, prevention and treatment of diseases of live stock, certain biologics are efficient, whereas others are in the experimental stage and still others are worthless. (This Association cannot endorse any biological product until its efficacy is definitely proven.)

3. Scientific research workers and producers of biologics have organizations of laboratory workers for the purpose of standardizing biologics, methods of production and nomenclature. These organizations have signified a desire to co-operate in every way with the A. V. M. A. for the improvement and standardization of biologics and the elimination of products that are proven inefficient. The Association recog-

Left to right: Dr. L. G. Richards, Dr. R. R. Dykstra, Dr. E. J. Frick, Dr. R. R. Birch. Jayhawkers all. Birch lives in Ithaca, N. Y., but at meetings chums around with the Kansas crowd, a sort of individual atavism.

nizes and commends this constructive work, which was taken up by the manufacturers upon their own initiative and hereby endorses and encourages a continuance of this work.

Preventive Medicine

Recognizing that prevention is the essential factor in the control and eradication of disease, this Association is committed to a policy of more general use of every established prophylactic measure.

The Executive Board recommends the approval of the foregoing policy by this Association, and further that the following committees be maintained:

First: A Committee on Policy consisting of five members selected as follows: The President, the Secretary, the Treasurer, the Chairman of the Executive Board and one member to be appointed by the President.

Second: A Committee on Veterinary Biological Products, to consist of five members selected as follows: A representative of the producers of commercial biological products; a representative of the Federal Bureau of Animal Industry; a veterinarian conducting research work not connected with a commercial concern; a general practitioner, and a state or provincial regulatory official.

The Foot-and-Mouth Disease Situation in California

The report on the 1924 outbreak of foot-and-mouth disease given by Dr. John R. Mohler, Chief of the Bureau of Animal Industry, at the Des Moines meeting of the A. V. M. A. was interesting information and of a most optimistic tone.

The celerity and the certainty with which each appearance of the disease in settled portions of California was eradicated as detailed in Doctor Mohler's paper, constitute an unanswerable argument in favor of the American method of dealing with this disease and preclude the thought of temporizing methods in handling this most communicable of known animal diseases.

The sure and prompt success of the control measures constitutes also a high tribute to the efficiency, loyalty and devotion to duty of the federal and state forces engaged in the work of eradication and to the ability of the veterinarians directing, supervising and performing the work in all its phases.

When the results in the settled portions of California are compared with the efforts that have been put forth and the results attained in England during the past year in combatting the present outbreak of foot-and-mouth disease in that country, the excellence of the American method can be better appreciated by contrast. In England where the natural conditions certainly make control work no more difficult than in the farming sections of California, the disease has persisted for more than a year, and eradication is not yet in sight, although the cost of the work has been three times the cost of that in the California outbreak and twenty times the cost of complete eradication in the settled portions of the state. There is no question but that our Bureau of Animal Industry could eradicate the outbreak in Great Britain in ninety days and could have eradicated it in that period at any time since its appearance in England or Scotland, if it could have the same co-operation and support from the authorities and the people that it had in California or would have anywhere else in the United States; and so could the veterinary profession of Great Britain for that matter if they had equal co-operation and support, but they haven't—the people are not willing to abide the inconvenience and temporary loss caused by the necessary quarantines or the immediate destruction of all exposed animals. The British authorities are timid and condone half-way measures; meanwhile, direct costs pile up at the rate of nearly a million dollars a month and the indirect costs, always greater than the direct, continue.

This unfortunate experience of our friends across the sea is not cited for the purpose of criticism, but only that we may ourselves in the future as we have in the past, adhere strictly to measures that have demonstrated their soundness in handling foot-and-mouth disease outbreaks and not give in to the pressure, and it is always great, that seeks to abate the rigors of present methods.

When it came to fighting the disease in the range country, to which it was carried by a hunter very early in the outbreak, the authorities were confronted with a new series of problems of unbelievable difficulty. Here was a country with few habitations—cattle as wild as the deer of the forest that could be examined only by roping from horseback and tying—a

terrain where trenches for burying infected animals could be dug only with drills and blasting powder and the expenditure of great labor in a country where labor was not to be had and difficult to provision if imported. Here were vast sections where no round-up, however thorough, could gather in all the cattle—places where strays would inevitably be overlooked and so not examined, where a thousand such might contract the disease, go through the attack and recover without having been found by the most diligent search, and perhaps some of them remain carriers of the disease for months and months to come. Here also wild deer became affected and the nature of the country is such that they cannot be exterminated for years, perhaps for a decade.

To make matters worse, if a more difficult situation for control work can be imagined, the authorities had a different type of people with whom to contend. No titled British landholder or aristocratic country gentleman has more thoroughly ingrained into him a supreme belief in his inalienable right to do as he damn pleases with his own stock than have the range cattlemen. A quarantine to be effective in the difficult range country had to be backed by overwhelming force, and the force had to be present in widely diverse and almost inaccessible places.

However, the presence of the disease in the wilds is definitely limited, and it will not be permitted to extend beyond these limitations. With the onset of severe winter weather, the cattle must come down out of these ranges or starve to death. They will then be placed with susceptible cattle and kept under observation and the carriers, if any, discovered. Time will free the ranges of the infection, unless the disease be carried over the winter by wild deer. If the deer do carry the disease through to the next grazing season (little is known of the degree to which deer may be affected), the quarantine of the infected range will simply have to continue until the deer, too, are eradicated.

The only place where infection is still suspected is in the Stanislaus National Forest in Tuolumne County, California. No new cases of infection have been discovered or reported since August 16. In that case only 2 cattle in a herd of 800 were affected and officials are hopeful that the prompt slaughter and deep burial of the entire herd destroyed the virus of foot-and-mouth disease before it could spread. Twelve large herds which were given a most thorough inspection on leaving the forest recently showed no symptoms of the disease. As an additional precaution those herds and all others which are allowed to leave that area will be inspected frequently for several months. Moreover, susceptible test animals will be kept with them long enough to make certain that no cattle carrying the disease are in the herds.

As a still further measure of safety, the Forest Service, acting on the recommendation of the Bureau of Animal Industry, will close the Stanislaus forest to all livestock during 1925. This will inconvenience a few neighboring ranchmen, but the action is necessary in the interests of public safety and economy. The value of the grazing in the area is small compared with the cost of suppressing another possible outbreak.

Although the danger to the livestock industry from this most recent outbreak of foot-and-mouth disease may fairly be said to be practically over, viewed from a distance complete eradication appears to the writer to be as yet far off. Still, Doctor Mohler, who has just returned from a two-months' tour of inspection of the infected locality, and who is certainly the best judge of the matter, gave a most hopeful outlook in his paper read before the A. V. M. A., leading hearers to think that he expected eradication to be complete before the end of 1924.

To date the public expenditure on account of the outbreak has been approximately $5,000,000. The indirect loss due to quarantines has been several times as great.

PASTEUR MEMORIAL AND RESEARCH SCHOLARSHIP

A movement is on foot in Chicago to erect in a prominent place a monument to Pasteur. A committee has been formed under the chairmanship of Dr. Frank Billings, with Dr. William Allen Pusey as vice-chairman. The monument will be executed by M. Leon Hermant, a French sculptor long established in this country, whose scheme has elicited the enthusiastic approval of all who have seen it.

Together with the monument, it is intended to honor Pasteur by founding a research scholarship, which will be open to all American students.

The promoters of the movement are less desirous of receiving large individual contributions than of reaching as many people as possible, so that the $100,000 which is required for both the monument and for the scholarship may come as an expression of the general feeling of all those who realize how much Pasteur has done for humanity.

European Army Veterinary Service

By Robt. J. Foster, Major, V. C. Fort Riley, Kansas

Our army veterinary service was originally modeled after the British Veterinary Corps, hence it is interesting to know how that service functions. So far as I had an opportunity to observe, no European veterinary service devotes much time or thought to meat and meat products inspection. They are principally concerned with the animal problems. I think that problems of the veterinary profession of Europe today, are those that concerned our profession 15 years to 25 years ago. The horse and dog are the practitioner's chief interest.

In Germany the slaughtering of food animals is decentralized and each community that has one or more municipal slaughtering houses, employ graduate veterinarians as meat inspectors and these men work independently of one another.

In England, the Doctor of Public Health is in charge of the abattoirs, and the veterinarian is engaged only in determining diseased meats under the Doctor of Public Health, whose word is final with reference to the use of the meat for public consumption. In Switzerland, the conditions are similar to those in Germany.

In these three countries, the army veterinary services are chiefly concerned with care and treatment of sick animals. They do inspect the dairies, that may furnish fresh milk and in time of war may be called upon to examine animals to be killed for food purposes, but this branch of veterinary science is a very unimportant part of their work as compared to its development in our service.

The British Veterinary Service

In the British army veterinary service, there are in round numbers about 285 veterinary officers, with a Major General as Chief Veterinarian.

The development of their service into what was without doubt the most efficient veterinary service in the late war, probably dates from their experiences growing out of the Boer War. Here, to quote from Major General Smith's Veterinary History of the South African War: "By bad animal management throughout the infantry, cavalry and field artillery, poor and indifferent remount service, to which a veterinary service formed a part," their army suffered a dead loss of 326,000 horses, 57,000 mules and 195,000 oxen, in a war lasting 2 years and 7 months. During the world war, the British used about 750,000 animals. The history of the British army veterinary service shows that over 70% of their animal casualties were returned to duty. A striking contrast to their South African experience. General Butler, R. A. V. C., in the report of the Egyptian expeditionary force, states that 80% of the horses and 70% of the camels, sick in veterinary hospitals, were returned to duty.

There are no such complete records available for our service.

The efficiency of the British veterinary service, with reference to animals can not be disputed. They have at Aldershot, a army veterinary school, where their field officers are given a refresher course, upon their return from foreign service. This is a 3 months course covering the following headings: Bacteriology, laboratory technique, urine, blood, immunity and serological methods, special bacteriology and pathology, protozoology, parasitology, hygiene, clinical observation and recording, veterinary police and repression, organization and map reading, photography, meat inspection. The veterinary corps also conducts there the army school for farriers (horseshoers).

The Swiss Veterinary Service

Now Switzerland maintains an army on the universal military service plan, that is peculiar to that country alone. They only have on active or permanent duty a very small training army. Their permanent veterinary personnel, consists of only nine officers. An officer of the rank of colonel is the chief veterinarian, and his office staff consists of three assistants. Then at their cavalry remount headquarters in Berne. there are three veterinarians on duty. Here is located probably the largest peace time military veterinary hospital in Europe. I was informed that they treated an average of 200 patients daily. I know it appeared full of patients at the time of my visit. Then at the field artillery remount at Thun, there are two veterinary officers on duty, where all artillery animals are treated.

The Swiss military system somewhat resembles our reserve officer idea. Their veterinary corps, if a mobilization was called, would consist of some 300 reserve officers, all assigned

to various organizations, hospitals, etc., so that in any national emergency they would place in the field a completely organized and equipped veterinary service.

The German Service

For the army permitted the German Republic, in accordance with the Versailles treaty, their veterinary service consists of 200 veterinary officers, with a lieutenant general as chief. Likewise the duties prescribed are only those pertaining to the care and treatment of sick animals, animal sanitation and horseshoeing service. Three military instructional forges, an army veterinary analysis office, (for laboratory work) in Berlin and a veterinary supply depot at Spandau, are maintained. Courses are also held each year for the purpose of continuing the scientific education of veterinary officers.

I have outlined briefly the European veterinary services, I have had an opportunity to see and know about. It will be seen that their chief functions pertain to animal hygiene, care and treatment of sick animals and preventive medicine.

By drawing these comparisons it will not be difficult to realize that the sponsors of our newly organized veterinary service will see their fondest wishes come true in a service for the United States second to none.

The Elimination, Symptoms and Diagnosis of Bacterium Abortus Infection

By John M. Buck, Pathological Division, Bureau of Animal Industry, U. S. Department of Agriculture, Washington, D. C.

Considerable knowledge as to how Bact. abortus may be eliminated by infected animals is available at the present time. Its presence has been repeatedly demonstrated in the expelled fetus, its membranes, and the uterine fluids of the dam at times of aborting and seemingly normal calvings, and for several weeks thereafter. That the organism contained in these substances is highly virulent is very apparent to those who have made use of them in the experimental production of the disease.

The milk of many infected cows likewise contains the causative agent. Cultural results have indicated that the milk seldom contains any great numbers of the micro-organisms per cubic centimeter. Our ability to cultivate it more readily from the udder secretions of infected cows which are practically dry, than from infected subjects which are being milked regularly leads us to believe that their multiplication in the udder is usually a rather slow process. The infective properties of Bact. abortus infected milk may not be especially pronounced. Our results in one attempt to transmit the disease to a pregnant heifer by the administration per os of 500 cubic centimeters of milk which carried the organism failed. The milk sample used was obtained from two different cows and the number of abortion organisms present per c.c. was probably in excess of the number commonly present in abortion infected milk. The infective properties for bovines of milk which carries the organism seems never to have been extensively investigated.

It has been demonstrated that bulls with infected reproductive organs may expel the organisms with their seminal fluid. The discovery of this fact is of considerable practical importance, because it not only reveals to us the limitations of sheath douchings, as a means of excluding the infection from the genital tracts of females at times of service, but it also enables us to appreciate the importance of so handling bulls as to prevent their discharges from contaminating premises accessible to abortion free stock.

Calves from infected dams in some cases probably disseminate the infection with their intestinal discharges. We have obtained results from the inoculation of experimental animals with calf feces that support this view.

Symptoms

The symptoms which denote the presence of infectious abortion are rather indefinite and inconstant. The act of abortion is probably the one which is the most widely known and readily observed, but may easily be misinterpreted, since all cows which abort are not affected with this disease. Its prompt recognition in diseased herds is moreover rendered difficult because of the fact that many animals which acquire the disease may never abort.

When the act of abortion occurs it may be preceded by changes in the dam that are com-

monly observed in cows which are approaching normal parturition such as enlargement of the udder, slight swelling of the external genitals, uneasiness, straining, etc. Discharges from the genital tract preceding the act may occasionally be observed. The fetus may be expelled during any stage of its development. If the fetus be small the act of abortion may occur unobserved. When the dam aborts during the early months of pregnancy the fetal membranes not being firmly attached to the uterus are generally expelled with the fetus, whereas during the later months of gestation their retention is common. Some fetuses may be born alive but too weak to survive more than a day or two.

Fluid or semi-fluid materials are eliminated from the genital tracts of aborting animals for a variable period following the act. Composed in part as may be the discharges of the fetal membranes that have undergone liquefaction the length of time that they persist is dependent to some degree upon the firmness with which the membranes are attached to the uterine walls as a result of the diseased process. The discharge is usually brownish or yellowish brown in color but may not differ greatly in appearance from discharges in cases of retained placenta not associated with the abortion bacterium.

The afterbirth when expelled or removed and examined before advanced putrefactive changes occur frequently shows certain lesions that are of considerable diagnostic value. Limited areas of the membranes may be thickened and studded with small elevations, and the borders of the placental cotyledons may consist of a yellowish cheesy-like necrotic substance. The irregular surfaces of some of the cotyledons may likewise be occupied by this cheesy-like exudate. The absence of these changes does not necessarily indicate that the abortion organism has not been active, however.

It has been observed that sterility is usually a troublesome factor in herds into which the disease has gained entrance. While cows which have aborted often may conceive promptly it is not infrequently necessary to breed an aborter five or six times before conception takes place. Heifers as well as the aborting cows in such herds may show irregularities in breeding.

Failure on the part of aborting cows to promptly conceive can reasonably be attributed to injuries sustained by the generative organs as a result of the retention and decomposition of the placenta, but the cause of an increased amount of sterility in heifers raised in infected herds is not wholly clear, since it is only in rare instances that the abortion organism has been isolated from their uteri.

Since sterility frequently causes the owners of abortion free, as well as the owners of abortion infected herds, more or less trouble, its presence does not constitute definite evidence that the abortion organism is involved. The retention of placentas likewise, does not afford definite information as to the presence or absence of the disease since this was a frequent calving complication in this country before infectious abortion became widely prevalent.

While none of the above mentioned symptoms furnish definite information as to the presence or absence of the disease, they may well, particularly the act of abortion, be regarded with suspicion, and justify the obtaining of more definite information as to their cause.

Diagnosis

During recent years the serum tests, so-called because of their application to the blood serum from the suspected animal, have been extensively used for diagnostic purposes. Those which have given the best results are known as the agglutination and the complement-fixation tests. The former is less complicated and in my experience quite as accurate and practical. Cases of recent infection seem to be detected by it more promptly than by the complement-fixation method, as in other diseases where these tests are used.

It should be borne in mind that the evidence furnished by the serum tests is circumstantial rather than direct, in other words we look for the effects of the causative micro-organisms rather than the organism itself. Whenever such tests are used in conjunction with incurable infectious diseases, the interpretation of results is not likely to be erroneous or misleading, but in affections where recovery is common their interpretation becomes more complicated, for the specific agglutinins or complement-fixing bodies may be present in the blood serum after the infection has completely disappeared. It is because of this feature that positive agglutination reactions in connection with bovine infectious abortion may signify either present infection or recovery. The intensity of the reactions, however, enables the diagnostician to distinguish between the two conditions with some degree of accuracy.

(This is the fourth of a series of six articles on bovine infectious abortion by Dr. John M. Buck. The fifth article, on prevention and control of the disease, will appear in an early issue.)

Necrotic Dermatitis in Horses and Mules*

By H. W. Wilson, Helena, Ark.

Necrotic dermatitis in horses and mules, affecting the skin above the hoof and in the fetlock region, is a very progressive, gangrenous infection, always associated with the presence of Bacillus necrophorus, and generally becomes a mixed infection, in which various staphylococci and streptococci are present.

The infection is usually found at the base of the coronet, or at the bulbs of the heels, but the original lesion may be any place in the fetlock region, and is characterized as an inflammation of the skin and varying in size from the head of a match to a dollar. One or two, or at most, only a few animals will be affected at first, as an enzootic, but in seven to ten days cases become more frequent simulating an epizootic in nature.

Of special importance are abrasions of the skin, from sharp objects or a diminution of the power of resistance of the skin through cold and muddy pens or lots, as is usually to be found in logging camps or on plantations in the lower part of the delta, poorly drained, as these abrasions in the continuity of the skin allow the infection to get started.

My first experience with this condition was while stationed at the remount depot at Fort Sill, Oklahoma, in the spring and summer of 1919, in which certain corrals were badly infected, and incidentally poorly drained around the feed and hay troughs. Since that time I have had several cases in logging camps and on certain plantations while in practice.

Infection is first noticed by a reddened sensitiveness and swelling of the skin, after which necrosis of the skin progresses until sensitiveness diminishes to complete anesthesia of the parts involved, and rapidly larger areas become diseased to the point where I have seen cases in which the primary lesion when found was no larger than a dime, and the animal would walk out of its hoof in forty-eight hours, preceded, of course, by a sucking sound as of a wet foot in a boot, as the wall and sole were loosened resulting from the sensitive lamina undergoing necrosis. The surface of the wound is raw, and has the appearance of being mouse-eaten from the necrotic area detaching itself from the less diseased parts.

Other pathogenic bacteria besides Bacillus necrophorus undoubtedly play an important part where a quick destruction of neighboring tissues results in such a short time. In more severe cases, the necrotic inflammation extends still deeper to tendons and ligaments, whereupon it leads to destruction of the joint surfaces and finally to general infection by metastasis. I remember one particular case in which I was called to see a mule on Sunday evening which had fallen through a hole in a bridge on Friday, but at the time seemed no worse for the accident, aside from slight abrasions in the skin at two or three points between the fetlock and hock on one leg. However, when the owner took me out to where the mule was eating grass in a small lot, he was very much surprised when I called his attention to an old sow chewing on this leg with apparently no inconvenience to the mule, as it was contentedly eating grass. This particular case had become too serious for treatment, and was immediately destroyed.

Treatment: At the outset the patient must be confined with ropes or stocks to prevent resisting the treatment. The dead and diseased portions should be removed with a knife or curved scissors, including at least one-half inch or more of normal healthy tissue at the outer margin of the infection, and thoroughly curetting more inaccessible portions at the bottom of the wound. Scrubbing with vinegar and using a stiff, coarse brush insures removal of any loose tissue that may have been overlooked, whereas the vinegar seems to have a specific action in controlling the infection, inasmuch as cases treated with vinegar baths for 30 to 60 minutes twice daily responded to treatment in much shorter time than just vinegar washings; following the bath, the following is painted on the wound and considerable area surrounding same, every few hours, or three or four times daily:

Methylene blue	dr. 2
Glycerin	oz. 3
Formaldehyd	oz. 1
Alcohol	oz. 8
Aqua qs ad	pt. 2

This treatment was given us at Fort Sill, after seemingly everything else had failed, by Captain James R. Mehaffy, who said he picked it

* Presented at Arkansas Veterinary Association, Little Rock, Ark., June 28, 1924.

up from a negro horse caretaker at the Du Pont Powder Works, Wilmington, Delaware. Mehaffy said his cases all died or had to be destroyed and a case given the negro to try his "sure-shot," just to satisfy him, and because the case would probably follow the history of the rest, promptly showed improvement on vinegar alone.

At Fort Sill we built a bath twelve inches deep, ten feet wide and about forty feet long, where we tied the worst cases to soak in vinegar, following the surgical attention. While in practice I have used a barrel sawed in two, using one-half of same to each foot.

When the infection is stopped, and healing takes place, as it does by granulation, it is surprising how fast many cases recover from large sized wounds.

Prevention is to be undertaken by removal of non-infected animals from mud and infected areas, together with close inspection daily for abrasions of the skin around the coronet.

Suggestions on Feeds and Feeding of Swine

By A. T. Kinsley

Many inquiries are received from veterinarians in different sections of the country relative to the feeds and feeding of swine. This is a problem that is difficult to discuss in generalities, because of the fact that the food stuff that may be available on an Illinois farm for feeding swine cannot be profitably used on a farm in Florida, Montana or Arizona. We believe that all veterinarians will find it profitable to study the problem of feeds and feeding of swine in their respective communities. If the veterinarian can intelligently discuss the problem of feeds and feeding with swine raisers and can impart information that will be of monetary value to the man who is producing pork and pork products, he is serving an important purpose in his community.

A food may be defined as any substance which may serve nutrient purposes. The type and amount of foods required depend upon the amount of waste, whether or not the animal is growing or fattening, and the nature and amount of exercise. The primary object of feeding swine is for development and fattening.

Some experiments have been conducted to determine the relationship and importance of nitrogen, phosphorus, ash and other ingredients in growing pigs. Generally speaking, it has been found that from one-half to one pound of protein should be consumed daily per 100 lbs. live weight of the pig. The total phosphorus in the body of ten-months-old pigs is distributed approximately as follows: 4/5 in the skeleton, 1/9 in the meat of the carcasses, 1/20 in the blood and other structures, excepting the fat and there is a trace also in the fat. The amount of phosphorus increases about 50 per cent in the skeleton from the time the pig is four or five months of age until it is ten months of age. The amount of phosphorus stored in the body during the growth is approximately one-fourth the total quantity consumed during the same period of time. The total ash in the body of a ten-months-old pig is distributed approximately as follows: 4/5 in the skeleton, 1/9 in the lean meat, 1/6 in the blood and other organs and the fat. As a pig becomes older the ratio or total ash in lean meat to the total ash in the skeleton decreases.

The quantity of carbohydrates and fats required depends upon the age and purpose of the animal. In addition to protein, carbohydrates and fats, a certain amount of mineral elements is essential. It has been found that mineral matters are of special importance in the development of fattening of swine. Calcium phosphate supplies the demands required in the usual developing pig and should be provided. Failure of properly balancing a ration results in malnutrition, dietary disturbances, or other conditions, thus resulting in economic loss to the swine grower or swine feeder. It should be understood that the same pig under different conditions will require distinctly different quantities of the same combinations of feeds, in order that it be properly maintained or developed. The hog can utilize the majority of waste products of a farm more economically than any other animal, but it is equally a fact that swine are not merely scavengers, they require some attention.

Diet depends upon the type of animal and its use. Mother's milk is the natural diet for the new-born. Sows, no doubt, differ in the quantity of milk produced, as well as the quality of the same, similar to cows. It has been found that some sows produce from 5 to 7 lbs. of milk per day for a period of from 8 to 12 weeks.

The analysis of sow's milk in a limited number of cases has shown that it contains approximately 7% of butterfat, 6% of casein and albumin, 5 to 6% of sugar and 1% of ash, or total solids of over 19%; thus sows' milk contains approximately 50% more total solids than cows milk. The fat globules of sows' milk are only one-fourth as large as those of cows' milk. From a few experiments it has been found that some sows rank favorably with good dairy cows in their ability to convert food stuffs into milk. The size of the fat globules is an important factor in the digestibility of butterfat or milk. Many orphan pigs that are fed upon cows' milk die of digestive derangement, because of the difference in the digestibility of sows' and cows' milk, due to the difference in size of the fat globules. A prepared milk approximating the composition of sows' milk may be made by the addition of cream, milk, sugar and lime water, and will be found quite useful as an additional food to sows' milk or to replace sows' milk in the case of orphan pigs.

The economical diet for pigs after weaning and until they are to be placed in the fattening pen or used for breeding, will vary according to location. The important factor is to maintain the pigs in a thrifty condition and favor the limit of development in size in a reasonable length of time. Pigs are developed most profitably in practically every section of the United States by pasturing. There are possibly certain exceptions, at least according to the agricultural methods now in vogue in restricted areas such as the wheat growing district of Washington and some fruit areas in various states, in which it is claimed that it is more profitable to use the land for other than pasture purposes for swine.

It is more profitable to feed small quantities of corn, barley or other feeds to pigs that are on pasture because it favors growth and hastens development. The various types of forage for swine pastures vary in different locations. Alfalfa, clover, blue grass, peas, soy beans, rape and a variety of other grasses and forage are successfully used. The grain or concentrates for swine on pasture should be so selected that the ration supplied is best suited for growth and development. Corn and barley balance the ration for pigs on clover, alfalfa and other legumes. These concentrates can be varied in quantity if tankage and milk products are used. Generally speaking, tankage or some similar food is especially valuable and it will be found that pigs on pasture that have access to tankage rarely root, indicating the tankage is supplying some required ingredient in the food regimen.

According to some investigations, the diet should be slightly different for pigs that are going to be used for breeding and those for fattening from the time of weaning. The breeding pig should be given about one-half lb. of protein or less per hundred pound live weight, and fattening pigs should be given 3/5 to 4/5 pound of protein per hundred pounds live weight.

For breeding sows a maintenance ration should be provided. Pasturing will be found economical for breeding sows and boars when not in service. Varying quantities of concentrates should be provided, using small amounts of grain until the later stages of pregnancy when the feeds should be changed so that there will be a limited amount of fat building elements and an extra quantity of nitrogenous and milk producing foods. The diet should be diminished a week or ten days prior to farrowing and for two or three days thereafter and then milk producing feeds should be provided in good quantities for a sow can not produce milk unless she is amply fed. Boars should receive a liberal quantity of concentrates during the breeding season and can be placed on a maintenance ration and preferably on pasture for the remainder of the year.

The economical ration for fattening swine consists of concentrates properly balanced. Many feeders believe that it is profitable to provide a small pasture at least in the beginning of the fattening period. Bulk foods such as may be obtained in pastures are of value in developing swine to stimulate an increase in the capacity of the digestive organs provided an excessive development and the production of the "pot belly" are avoided. Thus green foliage, such as may be obtained in pastures, or the use of corn cob meal and peanut hulls, is of value in fattening swine in the beginning of the feeding period, but distinctly a disadvantage after the swine are on full feed. Hogs weighing from 175 to 225 lbs. usually top the market and are therefore the most profitable market hogs. The heavy hog, that is, weighing 300 to 450 lbs., requires much more feed in proportion than 200 lb. hogs. It requires approximately 50 lbs. of feed when properly balanced to make a 100 lb. gain in live weight on a pig weighing from 50 to 100 lbs. It is generally estimated that one bushel of corn produces 10 pounds of pork, but one bushel of corn and 150 pounds of milk will produce 16 to 18 pounds of pork. Any feed is a benefit that will increase the consump-

tion of grain and hasten early maturity, provided the cost of such product is not prohibitive. The quality of pork produced must be of first consideration in the production of pork. Swine grazing on peanut pasture or fed exclusively or largely on peanut meal may make fairly good gains but the pork is undesirable because it is oily and does not become firm when the hogs are killed. Excessive quantities of rice bran also produce soft pork. A fair quality of pork has been obtained by feeding swine peanut meal in the beginning and finishing the last thirty days with corn, or using not to exceed 11 per cent of peanut meal during the entire feeding period. Rice bran can be successfully fed in the same manner as peanut meal.

Preparation of food stuff is important and is worthy of due consideration by all concerned in the swine industry. The grinding of corn effects a saving sufficiently to pay for more than the cost of grinding. Cooking is of no value for grain foods. It is of value in garbage feeds and it may possibly be profitable to cook such products as potatoes. The soaking of feeds is of little or no economic value. Possibly soaking may in some instances stimulate the appetite, but in more cases the soaking is not properly done and the foods are fermented and soured and thus result in more or less digestive disturbances. The method of feeding is also an important consideration in the production of swine. From various tests that have been conducted in practically all sections of the United States, there is no reason to doubt the efficacy of self feeders. It should not be construed that self feeders eliminate the necessity of labor; however, it does diminish the amount of labor necessary in caring for swine. The type of self feeder selected will depend upon circumstances and upon the personal desire of the feeder.

The feeder that provides the proper ration for developing or fattening of swine has the fundamental principle for success in the swine industry. Veterinarians should be familiar with the feeds and the food requirements of swine. The value of mineral feeds is now recognized by most men interested in the swine industry and most veterinarians appreciate the significance of minerals in the preparation of a ration for swine. The preparation and methods of feeding are individual problems on each farm and the most successful veterinarians are helping the hog raiser to solve those problems.

Heavy Losses from Mange Mites of Hogs

Heavy losses of pork products due to mange mites of hogs have been reported lately to the United States Department of Agriculture by its inspectors in the Central West. In addition to being an irritation to hogs, resulting in general unthriftiness, mange mites cause meat losses running into hundreds of thousands of dollars annually, according to recent information obtained.

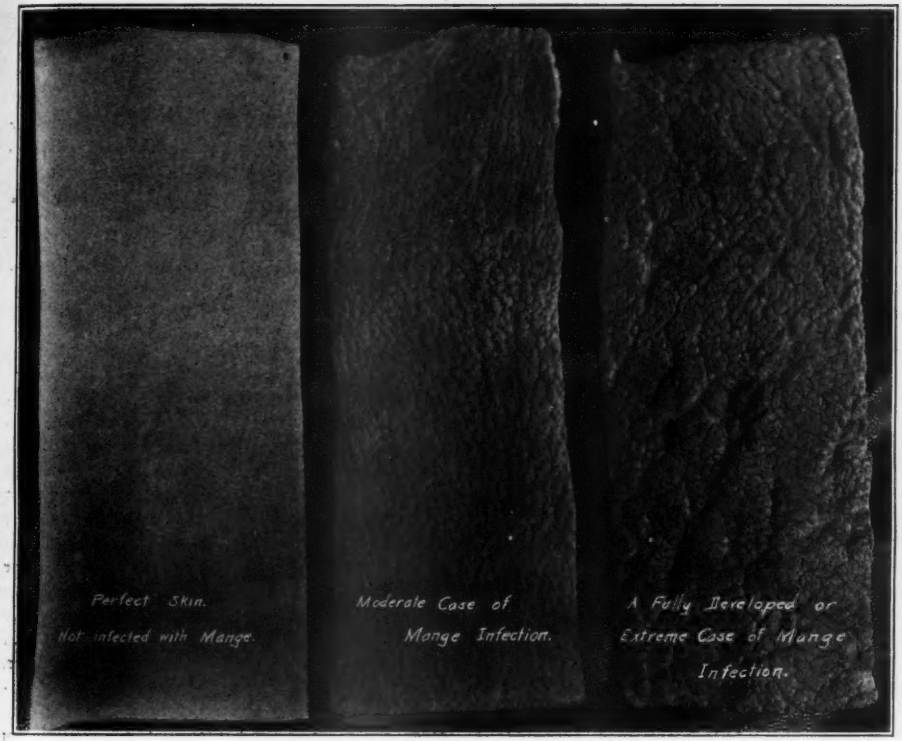
H. F. Veenker, Superintendent of Morrell's packing plant at Sioux Falls, S. D., read a paper on the subject at the A. V. M. A. meeting at Des Moines and also exhibited photographs showing how carcasses are damaged by the mange parasites.

In discussing Mr. Veenker's paper, Dr. H. B. Raffensperger stated that mange in hogs is a problem of farm management solely and can in the main be solved by good feeding, certainly by good feeding and good surroundings. He pointed out that mange is very widely distributed among the hogs of this country and possibly 90 per cent of the animals harbor the parasites of sarcoptic mange. But it is only when the conditions are favorable to the parasites and unfavorable to the hog that the mange becomes important.

A number of veterinarians in the Middle West were inclined to disagree with Dr. Raffensperger, claiming that they knew of serious outbreaks of mange in hogs where the management and feeding were good. Dr. Raffensperger, however, stood his ground firmly and appeared to have somewhat the better of the argument.

The writer a number of years ago pointed out that both follicular and sarcoptic mange are exceedingly common in city dogs, or at least such is the case in and about Chicago, and both sarcoptic and demodectic parasites could be found in a large percentage of dogs coming to his hospital. It was also pointed out at that time that it was the dog enfeebled by distemper or other wasting ailment, a victim of bad housing, improper care of the skin or deficient nutrition that developed the serious cases of mange.

Dr. Benbrook, parasitologist at the Iowa State College, stated that mange parasites could be



found on a large percentage of the dogs presented at the clinic at the college but that serious cases of mange in dogs in the vicinity of Ames are rare.

Dr. A. T. Kinsley had an article in the April issue of Veterinary Medicine on the increase of sarcoptic mange among swine, the illustrations and some of the data for which were supplied by Mr. Veenker. One of the illustrations is reproduced herewith.

Fully 40 per cent of the hogs slaughtered in South Dakota during the winter months of 1923-24 showed evidence of the mange mites, though only about one-half of that number were sufficiently affected to cause definite losses. The mange parasites damage the hams, bacons, and picnics principally—the parts of the hog that are of greatest value. The pest is most troublesome during the colder months when most hogs are marketed.

The damage to hog carcasses caused by the mites assumes the form of roughened skins and inflammation. In some cases the meat is entirely unfit for food. In other instances the injury places the pork products from such hogs in the lower grades, which have a reduced market value of from 3 to 5 cents. The observations made in South Dakota are believed to be typical of other important swine-growing states.

The United States Department of Agriculture points out that losses due to mange mites are largely preventable. Treatment consists in the application of various simple remedies, ranging from mixtures of kerosene and lard to specially prepared mite-control dips. The hogs may be treated by hand application, hog oilers, spraying, medicated hog wallows, or by dipping. In applying the treatment swine owners should always treat the entire herd, whether all animals show infection or not. Medicated hog wallows are one of the most practical means of reducing mange-mite infection, since the instinctive habit of hogs is to wallow in water. By medicating the water in properly constructed wallows, the remedies take effect with a minimum of expenditure of money, time, and labor.

Farmers' Bulletin 1085, "Hog Mites and Hog Mange," discusses practical methods of control and eradication.

Items of Interest to the Practitioner

By A. T. Kinsley

According to the public health report, it has been found that the pollution of oil adjacent to refineries interferes with the normal oxidation of sewage and it also renders clams, oysters and other fish unfit for food because of the absorption of the oil, thus giving an undesirable flavor.

Dr. John J. Abel, Professor of Pharmacology at the Medical College of the Johns Hopkins University, has devised an artificial kidney which is proposed to be attached to an artery on the external surface of the body. The mechanism is so constructed that any filterable constituent of the blood that should not be removed, such as sugar, is prevented from escaping through the celloidin tubes because they are submerged in a solution that contains the same amount of sugar as the blood. In preliminary tests made of Abel's artificial kidney on dogs, it has been found to operate so rapidly and efficiently that the living normal kidneys in the animal tested did not secrete but were relieved of their work and therefore could be in a state of rest. If this artificial kidney proves effective when attached to the artery of the human, no doubt, many lives can be saved, particularly those cases in which the kidneys are overtaxed or for some other reason fail to function.

The Michigan Department of Health has suggested that the most effective method of controlling goitre in the human is to enact a law providing for the iodizing of all salt for human consumption. This method seems simple and no doubt the results would be effective, and such a law could include the iodizing of salt not only for human consumption, but also that used for stock.

Sir Arnold Theiler, of the union of South Africa, while in the United States last year discussed the following method that is employed in the control of stomach worms in sheep in that country. A mixture of copper sulphate and sodium arsenate is used. The first treatment consists of two doses on successive days. Following this, single doses are given at intervals of one month until the last treatment which consists of two doses on successive days. The drugs are given as a powder by means of a teaspoon. Sir Arnold Theiler remarked that this is quite effective in controlling the ravages of the stomach worm and was much safer in the hands of the farmer than the use of solutions. The powder treatment has been used in that country since 1916 during which time some 60 to 80 million sheep have been treated.

An outbreak of gastro-enteritis occurring principally among children in a certain district in New York was determined to be paratyphoid infection. Each of the fifty some patients had used certified milk produced and sold by a single dairy. It is of interest to note that during the investigation it was found that one of the cows that had been supplying milk had an attack of acute mastitis from which a streptococcus was isolated, and had no other investigations been made, it is possible that the cow would have been held responsible for the outbreak. However, the source of paratyphoid infection was found to be one of the milkers. This report emphasizes the necessity for thorough and complete information before arriving at definite conclusions concerning an epidemic of sickness traceable to a milk supply.

From 340 to 350 pigs out of every thousand farrowed die before weaning. The greatest factors in the loss of pigs are pulmonary ascaridosis, scour and necrotic enteritis.

Reports indicate a decrease in the 1924 spring pig crop, also an increase in the acreage of corn planted. Recent developments indicate a diminished yield of corn and the present higher trend in the price of hogs suggests the possibility of high priced pork and corn in the next six months.

There was 1 per cent more milk cows in the United States, according to estimates, on January 1, 1924, than there was on January 1, 1923.

The world's annual production of wool is approximately 24 billion pounds. About one-half of this is produced north of the equator and the other half south of the equator. The United States produces only 12 per cent of the

world's clip. This indicates the possibility of increasing sheep production in the United States.

According to estimates there were 30 million pounds of condensed or semi-solid, and about 8 million pounds of dried buttermilk produced in the United States in 1921. Since that time the output of these products has greatly increased and still only a small percentage of the total amount of available raw products is so utilized. The buttermilk products have been found to be essential feeds and are particularly adapted to swine and poultry and especially when there is any enteric disturbance. A series of calves fed at the dairy division of the University of Minnesota on buttermilk products were noted to be unusually free from sickness or digestive troubles. The calves apparently relished the buttermilk preparation and in most instances preferred it to whole milk. Scour did not occur in a single calf being so fed.

Relations of the Veterinarian to His Clients and Community*

By S. J. Schilling, Dept. of Veterinary Medicine, University of Arkansas

On July 14, 15 and 16, there was held at Medicine Park, Oklahoma, the convention of the Oklahoma State Veterinary Medical Association. The program was made up of subjects as follows: Veterinary Prestige, The Veterinarian's Relationship to Civic Organizations, County Agents of Colorado, Methods of Interesting High School Students in Veterinary Medicine, City Milk and Meat Inspection, The Veterinary Officers' Reserve Corps, Professional Ethics of Today, The Public in Relation to Control Work, Public Confidence, Rabies, The Veterinarian.

It will be noted that with the exception of one address (on rabies), all of the other papers presented at this convention and the discussions which followed such papers were planned to hinge around **not** the scientific aspects of veterinary practice, but rather around the human aspects—the relation of the veterinarian to his clients and his fellow men. What is attracting the interest of the veterinarian of Oklahoma today is the answer to the question which has frequently been propounded of late: "What is the matter with the veterinary profession?" In other words, the problem, as seen by our professional brothers in our neighboring state, is to secure a better understanding, a greater degree of confidence—in general, more happy relations between the veterinarian and those whom he serves.

My paper as given on the program was intended to relate to research problems in veterinary medicine. However, it is an unfortunate fact that our scientific progress does not march forward in leaps and bounds, so that each year there can be reported to such a gathering as this any large number of discoveries of research workers which will stand the test of time and prove to be important additions to our knowledge. Probably we would profit to a greater extent if we spend a few moments in weighing some of the considerations which constitute problems which every one of you has to consider in your practice.

We can, I think, take it for granted that the work of veterinarians is at present not appreciated to the full extent by the public at large. Relatively few people have any conception of the work that is being done in protecting public health by the eradication of bovine tuberculosis. Few people know that the work of the veterinarian in the inspection of food at the packing plant, the local meat market, restaurant, and dairy, is an important contribution toward safeguarding our food supplies. They do not stop to consider that, were it not for the veterinary forces, plagues like hog cholera, pleuro-pneumonia, and foot-and-mouth disease would soon double or treble the price of pork and beef if they remained unchecked. And leaving aside that group of diseases which cause what one might describe as spectacular losses, they are not acquainted with the fact that but for the veterinarian the live stock industry, on which all farming must ultimately rely as a basis, would be in a hazardous position indeed. The average annual loss of farm animals due to disease and exposure, in the United States for the last ten years, was $200,356,000. In order to gain a conception of what this loss represents, one might cite the fact that all live stock in

*Address at meeting of Arkansas State Veterinary Association.

the state of Arkansas is worth $55,000,000. Therefore, the loss which this nation as a whole suffers annually is four times as great as the value of all animals in this state. This loss is largely preventable.

This information, and much more, should be put before the public in a judicious bit of advertising, for it appears that advertising of the veterinary profession is the solution to an improved understanding between the veterinarian and his client. However, we should not rely on pointing to the work which we have done and are doing, in establishing a firmer friendship with those whom we seek to serve. We should seek new fields of service in which to come in contact with our clients. One such field is suggested in the list of subjects on the program of the Oklahoma convention. Dr. R. C. Moore, of St. Joseph, Missouri, there presented a paper on the relation of veterinarians to civic organizations. These civic organizations, be they Rotary Clubs, Lions Clubs, Chambers of Commerce, or community clubs, offer an excellent opportunity for a veterinarian to get into contact with a large group of people which he otherwise would not reach, and in a different and more effective manner than is frequently afforded him on a professional visit. It is true that in some sections such clubs may not exist, but by judicious activity the veterinarian can arouse interest so that organizations of this type may be formed. Mere membership, however, is not sufficient, though that in itself is to the veterinarian opportunity to mingle with his clients on a basis different from that which exists when he calls on a professional visit. There is the opportunity for the presentation of a paper from time to time on some particular problem pertaining to the health of animals in which that community is, or should be, interested. Naturally, any address presented at such a meeting could not with propriety have the flavor of an appeal for business. It should rather be designed to impart useful information which the farmer may employ in more intelligently handling his live stock.

The greatest problem of today, taking the state as a whole, that we have to deal with, is not with specific diseases. It is true that in certain localities certain diseases stand out as by far the most important from the standpoint of causing losses of horses and cattle or other animals. As an example, consider the anthrax and black leg districts. Yet, if one were to take the state as a whole, it is undoubtedly true that parasitism, malnutrition (including poor water supply), and lack of shelter, under which considerable unsanitary housing also falls, cause a greater loss to the farmer than do specific diseases. These losses are not necessarily measured by the death of animals. We know that an animal may be heavily infested with parasites, and yet if reasonably well fed will maintain itself. But we know also that such infested animals cannot be hoped to produce the gallons of milk, or the pounds of pork or beef, as can animals free from parasites. While malnutrition occasionally results in the death of animals from actual starvation, more frequently it merely weakens them, making them more subject to the ravages of disease, or stunts them in growth, or impairs their capacity for work. There is great need for some one to present information of this nature to the agricultural population and none is better fitted to impart it than the veterinarian.

Another paper on the program of the Oklahoma convention pertains to county agents. It is true that in certain sections county agents and agricultural college graduates teaching in agricultural high schools are called upon to a certain extent by farmers for veterinary advice. That such advice must be of mediocre quality cannot but be apparent to any thinking man. The agricultural college graduate has not had the opportunity to specialize in veterinary medicine. He may have taken a few courses in anatomy and physiology and some work in animal diseases. When he goes out to his job, he feels just as you and I did when we first graduated from the veterinary college. If you can remember the first case you treated, it was probably somewhat similar to my experience. I approached with hesitation because, though I had had the theoretical training in the school, I knew that I was lacking in experience and I felt unequal to making a proper diagnosis. With experience, however, came confidence—and confidence is something which the agricultural high school teacher or the county agent can never acquire with his inadequate preparation for handling veterinary problems. He handles them chiefly because he feels that he is compelled to do so in order to hold his job. The Quorum Court hired him as a Farm Adviser, and advice he must give, and he does the best he can.

This is a situation which cannot be changed by legislation. So long as the farmer feels that the veterinarian is in somewhat the same position as the lawyer, and charges for any advice he gives, this condition probably will continue. Not all farmers will appreciate the difference between securing advice from a county agent

and from a veterinarian. The county agent "looked it up in the book," and since the book says so, it must be right and must be just as competent a source of information as though the veterinarian had given it. If, then, the veterinarian in all cases would establish himself on friendly relations with the county agent, in addition to his activities in community organizations, he would have another means of contact. If free advice is to be given, in any case it would better be the veterinarian dispensing this free advice than the county agent. And even though the veterinarian gives this service free, it will lead many a time to a bona fide call to professional service which otherwise would not have been forthcoming.

A third means of publicity which the veterinarian should avail himself of in order to bring his work before the public is the local press. Country editors are always anxious to get copy for their papers, and material which is reasonably well written pertaining to any subject on sanitation, nutrition, management, breeding, care, feeding and finishing, in addition to the types of information previously suggested in this paper, will be very acceptable to most of them.

Another means of advertising which is open to us and which we should take advantage of is that of having displays at state and county fairs. Such displays, while carrying placards indicating that the veterinary profession is responsible for them, should not have the least flavor of appearing to "drum up" business, but rather should be along lines encouraging the raising of better bred animals and following of better principles of live stock management. This would immediately identify us as a group of men working for the altruistic purpose of improving rural life. Professionally, that is the only type of advertising that counts.

It is true that in Arkansas we have our own peculiar problems. It is true that whereas in this state the total value of all live stock is $55,000,000, while in the state of Iowa, with a similar area, the value of all farm animals is $431,000,000, or almost eight times as great; that the average price per head of cattle (leaving out of consideration dairy cattle) is $8.80 in this state and $35.20 in Iowa; that the average value of milk cows in this state is $24.00 and is $58.00 in Iowa; that the average price of hogs in this state is $6.90 against $12.80 in Iowa;—yet these figures only emphasize the point that it is to our best interest to work with our agricultural population, having in mind particularly the improvement of agricultural conditions by improving the type of live stock that is raised. There is no reason why as valuable stock cannot be raised in this state as in other states; and there is no reason why, in most sections, there cannot be as many head of stock raised per square mile as there are in Iowa. If the number of animals were increased, and the quality as well, the call for professional services would far exceed any possibility of our present forces for meeting it. Quackery does not thrive either, where more valuable cattle are raised, and this evil would be greatly diminished.

In conclusion, may I state that if the members of the veterinary profession will avail themselves of the four means of bringing themselves in the public eye which I have suggested, namely: working with civic organizations, working in conjunction with county agents and agricultural teachers in high schools, the publication of articles in newspapers, and exhibits at fairs—I am certain we can accomplish much to make for ourselves a better place in the public esteem. Not only that, but we will also be improving agricultural conditions in this state, and as we improve agricultural conditions and the live stock industry, we make conditions more favorable for business as well as helping in a good work to the benefit of our community.

COCKLEBURS FOUND POISONOUS TO LIVESTOCK AND POULTRY

Cocklebur plants are poisonous to swine, cattle, sheep, and chickens, according to the United States Department of Agriculture. This weed has long been suspected, but many persons thought that deaths reported from this cause were produced by the mechanical action of the burs rather than by the toxic effect of the plant. While the burs may produce some mechanical injury, and while the seeds are very poisonous, stock poisoning, the department says, is caused by feeding on the very young plants before the development of true leaves.

To avoid losses from this cause the most important thing is to prevent the animals from eating the weed. If there is a shortage of good forage, they may eat enough of the young cockleburs to cause serious results. Feeding milk to pigs immediately after they have eaten the weed has proved beneficial, probably because of the fat content. Good results also may be expected by feeding them bacon grease, lard, or linseed oil.

Helpful Hints in Equine Practice

By L. A. Merillat

SEROUS SACS OF THE SHOULDERS

These consist of subcutaneous or subfascial extravasations of blood serum and lymph caused by bruising and are located on the shoulder at the chief point of traction. At first the extravasations are mere infiltrations of the tissue spaces, but under the constant bruising of enforced service day after day, they develop into collections of serum of considerable size, extending across the collar seat and upward into the middle third of the scapular region. The sac at first is not walled off but later a limiting membrane will form to circumscribe the contents. Some become infected through cutaneous lesions and terminate as abscesses. The average serous sac of the shoulder when presented to the veterinarian for treatment is a bulging, slightly sensitive, fluctuating enlargement, two or three inches thick, six inches wide and about ten inches long, that is still without a well defined wall. It has been annoying the horse for about a week or more and is now submitted for treatment because further attempts to force service out of the brute would be cruel. Often the patient is a young horse that balks at any effort to make it pull.

The practitioner implored to hasten a recovery, usually lances the sac and leaves instructions to irrigate the interior with an antiseptic solution which he provides. In a few days the interior, which was a sterile cavity, becomes inflamed from the self-introduced infection and the patient goes through the slow course of cicatrization characteristic of infected cavities. That is, a month passes before the patient is healed and even at the end of that time, there is a sensitiveness of the shoulder that annoys the patient for some weeks longer. Some horses so affected are more or less disabled during the whole summer season. With these salient points in mind, it seems important to study out a treatment that will shorten the period of disability as much as possible. The healing of such a lesion involves the reattachment of the separated elements. That is, the skin must reattach itself to the superficial fascia or in the deeper varieites, the deep fascia and panniculus carnosus must reattach to the underlying musculature. The reparative process required to attain these ends is more rapid if not hindered by infection. Contrary to the general impression, free lancing and irrigation, which are always followed by suppuration, retard healing and are certain to excite a sensitiveness that will disappear very slowly. Our best results have always been obtained by strictly aseptic management, while free lancing, packings and irrigations have always in our hands transformed this benign sac into an infected cavity that cicatrized stubbornly and that often required subsequent evacuation.

Our plan of handling these injuries, and the plan applies equally well to serous sacs of the buttocks caused by breechment bruises, is as follows:

Wash and disinfect well a small field about two inches square at the very lowest part of the sac, shave the hair and paint well with tincture of iodin, then evacuate the contents by an incision three-quarters of an inch long, made with a sterilized scalpel. Part the lips of the incision with a sterilized forceps and press out every drop of serum by gentle strokes of the hand over the sac. Control completely any bleeding from the small vessels that may have been cut. Generally there are one or two vessels that bleed stubbornly. These must be controlled; otherwise, the bottom of the cavity may fill up with a blood clot that will complicate matters. If the horse is in the hospital where aseptic attention is assured, we simply wad the incision loosely with a wick of iodoform or sterilized gauze twice a day and at each dressing carefully press out the serum that has accumulated. After four to six days of this careful dressing, the sac is already closed above; only the lower part still yields a limited amount of serum when pressed with the hands, and even if through some error the incision has become infected, the suppuration is slight and the infected zone limited to its immediate environs. At the end of a week to ten days, no further attention is required.

In outside practice where aseptic wound dressing cannot be expected, we apply a drainage tube instead of the gauze wicks and then forbid any interference except that of faithfully pressing out the serum twice a day by gently stroking the sac with the hands from above downwards. The tube for this purpose is a quarter-inch soft rubber hose about one and one-half inches long. We perforate one end with two holes and then transfix the hose just

behind them with a finishing nail one and a half inches long. The tube and nail are then passed through the incision into the sac, leaving the other end to protrude. The nail prevents the tube from falling out, as it now lies transversely across the incision within the sac. The tube may then be fixed by taking a stitch in the skin just above it. The tube and nail must have been previously sterilized and then handled so as to avert contamination while being put into place. The wound around the tube may be peppered each day with iodoform to prevent infection from without. At the end of six days the tube is removed, but the stroking of the sac with the hands should be continued as long as there is any discharge.

A trial of these methods of handling serous sacs of horses will soon convince the most skeptical that such procedures are far superior to lancing and packing with oakum soaked in turpentine and linseed oil.

Unfortunately, the foregoing plan applies only to the more recent cases. When a serous sac becomes old, it is bounded with a pretty well organized wall consisting of fibrin permeated with fixed cells and leukocytes, which later may even develop into a membrane of connective tissue. The corpuscles in the serum dissolve and leave a pure amber colored fluid as the contents of a sac that will sojourn indefinitely. When this stage has been reached, it is best to lay the sac wide open, wipe out the interior with a sublimate caustic and then treat it as an open wound. Such cases will disable horses for six weeks or more, while the recent ones should be well in two weeks.

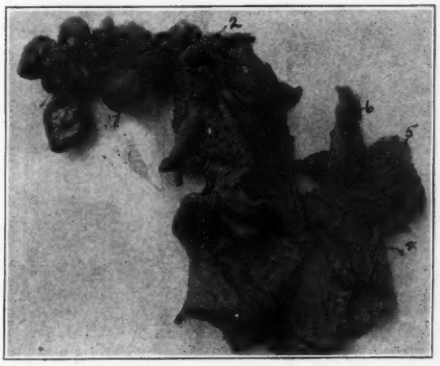
The Reproductive Organs of the Fowl

By Dr. B. F. Kaupp, Chairman, Poultry Group and Poultry Investigator and Pathologist North Carolina State College, and author of Poultry Diseases, Anatomy of the Domestic Fowl, Essentials of Poultry Raising, Poultry Culture Sanitation and Hygiene, and Animal Parasites and Parasitic Diseases.

The first article of my series on diseases of poultry was on the digestive tract of fowls and it naturally follows that this one should be on the reproductive organs of the fowl dealing especially with the egg forming organs.

The Male Reproductive Organs

The male reproductive organs consist of two testicles, and two vasa deferi. The testicles are located just anterior to the kidneys and are attached to the inferior bodies of the vertebrae by connective tissue. In the young chick, they are very small, scarcely as large as a navy bean, and do not begin to increase in size until the comb and wattles begin to increase in size. The comb and wattles of both hen and cock are external sex characters and indicate the condition of the reproductive organs. As the comb and wattles begin to grow, in the cockerel, the testicles begin to grow until by the time the cockerel is fully grown the testicles, in a large bird, as the Rhode Island Red, are approximately an inch in diameter and nearly two inches long. In birds that go down in vigor and those with constitutional diseases the testicles may again reduce in size. There is no well developed globus minor as in animals. There extends from either testicle a tortuous vas deferens which lies on the under side of the kidney and which opens on the upper part of the cloacal mucous membrane by a turgid papilla which becomes erect during the sexual orgasm. The sperm are either thrown in the cloaca or in the lower portion of the vaginal portion of the oviduct. Experiments in this department have shown that spermatozoa placed



Ovary and Oviduct of a Laying Hen. 1, yolk in process of formation showing, at under part, the stigmal line; 2, funnel portion; 3, second or albumin secreting portion; 4, third or isthmus, the membrane secreting portion; 5, fourth or shell gland secreting portion; 6, fifth or vaginal portion where tint and bloom is put on egg.

on the cloacal lips may reach the oviduct and fertilize the egg of the hen. Fertilization of the blastoderm is supposed to take place in the ovarian pocket after the yolk has been discharged from its capsule.

The Ovary of the Fowl

In an examination of the ovary of a young half-pound pullet it will be observed to be very small and shaped somewhat like a bunch of grapes and made up of small globes some of which are scarcely visible to the eye. There are 900 to 4500 of these cells, each one capable of developing a yolk. If the ovary of a hen that has died, in laying, be examined, the ovarian mass will be observed to be almost half the size of one's fist. And if by contrast a hen be examined, that has died after she has ceased to lay for two or three months, it will be observed that the ovarian mass has shrunken to scarcely larger than one's thumb.

If a hen is to lay a three-egg cycle before resting a day or more, there will begin the formation of one yolk a day for three consecutive days. The ovules or globules referred to above are single cells with their central nuclei. The cell that is to be developed into a yolk now receives microscopic droplets of yolk material and finally after a few days the yolk is fully formed. The yolk forms in a capsule. The yolk is made up of a layer of yellow yolk or fat, and an alternate layer of white or albumen. This yolk material is a perfect food and is capable of yielding all of the elements needed to form the egg and some left over to be incorporated in the abdomen of the chick and known as the abdominal yolk sac. This is sufficient food for the chick for three to four days after it is hatched. Here is the important point, for at this time the hen must receive the proper food elements which means that she must be properly fed so that there will be stored up proper minerals and vitamins as well as fat and albumin. If the hen is short, and she cannot manufacture it synthetically, the eggs may not be hatchable or the chicks livable. Green feed and minerals as bone meal and one per cent table salt is essential as an adjunct to the feed.

The nucleus of the mature yolk is represented by the blastoderm, lying on one side of the yolk mass, and is fertilized, if at all, after it drops from the capsule, in which it develops, into the ovarian pocket. The blood vessels separate on the capsule of a mature yolk or ovum, making the stigmal line, so that when the yolk is discharged there is no hemorrhage. If, for some reason, there is a congestion of the blood vessels there may be a vessel opened in this process and a drop of blood escape and appear in the market egg on the outer surface of the yolk and be objected to by the buyer though the egg is fit for food.

The Oviduct and Its Function

In the examination of the young pullet, in the illustration, it will be observed that the oviduct extends from the ovary along the left side of the roof of the abdominal and pelvic cavities and is attached to the upper wall of the cloaca. It is about the size of a knitting needle. In the laying hen it was observed that it is quite large and arranged in the body in three folds and anchored firmly by two ligaments quite web-like and delicate. It is attached to the lower portion of the bodies of the dorsal vertebrae by a fan-shaped superior ligament, and by another, an inferior ligament, inferiorly. When the oviduct is torn from its anchorage, and extended, it is found to be 20 to 24 inches long and as thick as one's finger.

In the hen examined that has been out of laying for two or three months, the oviduct has been found to have undergone a shrinkage and is no more than four and one-half to five inches long and is less in diameter. This shrinkage is what makes the capacity and pubic span of a hen vary, becoming greater in the laying hen, and again less in the hen out of laying for a considerable time. When the ovary and oviduct increase so enormously, together with a lengthening of the intestines for from 30 to 40 per cent, it is readily seen that the capacity and the pubic span must increase as the bones, of the body involved, change their relations so that the abdominal cavity can accommodate the increased bulk of organs. Therefore, capacity and pubic span indicate what the hen is doing, or is getting ready to do, and the degree indicates the intensity or number of eggs she is laying, or getting ready to lay during the year.

The oviduct is divided into five parts. When the yolk is discharged from its capsule, in which it develops, it falls into the ovarian pocket and enters the funnel or first portion of the oviduct. From the funnel it passes into the second portion of the oviduct or albumin secreting portion, indicated at 3 in the accompanying cut, and constitutes the major portion of the entire canal. It is here that the albumin is secreted. The egg now passes into the third portion or isthmus indicated at 4, and here the two shell membranes are formed around the egg mass.

After the membranes are formed the egg passes into the fourth portion, indicated at 5, and here the shell is formed. This portion is also called the uterus. The egg now passes into the fifth portion, or vagina, where the tint is put on it, if a tinted egg, and also the bloom or varnish coat.

By opening the oviduct of a laying hen it will be observed, as shown in the picture, that the mucous membrane is thrown into longitudinal folds. These folds are low in the funnel portion, quite high in the albumin secreting portion, scarcely visible in the isthmus, and reach their highest development in the uterus, or shell gland portion. At this point the folds are almost leaf like. The folds are again very low in the vaginal portion. It requires eighteen to twenty hours for the egg to finish forming, after the yolk has been discharged from the ovary, and several days for the yolk to develop as it requires about 12 to 14 days to bring a hen into laying.

Poisonous Plants

By L. H. Pammel

MILKWEED POISONING

Dr. W. H. Lytle of Salem, Oregon, sends a specimen of milkweed (Asclepias speciosa) which he says is suspected of being poisonous.

It has been shown by C. D. Marsh and A. B. Clawson that certain species of milkweed are poisonous. This is especially true of the whorled milkweed. It has long been known that the Mexican milkweed (Asclepias eriocarpa) is poisonous to sheep and other range animals.

The Asclepias speciosa occurs in northwestern Iowa to Colorado, Utah and the Pacific northwest. It somewhat resembles our common milkweed (Asclepias syriaca). The western milkweed has larger flowers and the leaves are somewhat more pubescent than the common Iowa species.

The recent experiments made by C. Dwight Marsh and A. B. Clawson show the following symptoms:

"It has been found that the plant is extremely poisonous. Less than two ounces may poison a sheep of average size and three ounces may kill such an animal. The poisonous dose for cattle is about the same as that for sheep if computed in percentage of weight. Not only is this plant very poisonous but experimental work seems to indicate that fatal results probably will follow feeding on it.

"The first and perhaps the most marked symptom of poisoning is depression, which is shown in the lowered head and humped back of the animal. This depression is followed by weakness, the poisoned animal lying down most of the time. The severely poisoned animals have a marked diarrhea and a complete loss of appetite, during the time of the illness. The effects of the plant come on ordinarily only after a considerable period averaging as much as 16 hours, and the illness continues, in those that recover, for two days or more."

These writers have shown also that the hay is poisonous. Therefore, hay containing this plant should be fed with caution. The summary of the work by the above authors on the California milkweed (Asclepias eriocarpa) shows:

"That a plant growing rather abundantly in parts of western California, has been suspected of being poisonous to sheep. It has been shown to be very poisonous not only to sheep but also to cattle.

"While animals are not likely to eat it except when other forage is scarce, it is dangerous because of its especially toxic character, for as little as 0.1 of a pound per hundredweight of animal may poison, and 0.22 of a pound may cause death."

SWEET CLOVER INJURIOUS

Dr. W. M. Ray of Clark, South Dakota, sends the following letter which may be of interest to readers of Veterinary Medicine. It would be interesting to know if other readers have had similar experiences.

"I wish to report to you a condition on two different farms in this vicinity during the past week. On one farm the owner placed his herd of pure bred Herefords on an exclusive sweet clover pasture on Monday. Wednesday one cow was found dead. Upon autopsy a ruptured bowel was found, caused from bloat.

"I advised taking the cattle out of the sweet clover during the time which it would be wet with dew or rain; this was done. On Friday they were turned in at 10 o'clock and left until 6 p. m. Saturday a. m. another dead cow was found badly bloated. I might also add that on the morning the first cow was found dead, three

others were badly bloated, but responded to treatment by tapping.

"On another farm where exclusive sweet clover was used for pasture, one animal was found dead, with another badly bloated. On my own farm I am using sweet clover and have not as yet had any trouble and no others have in this vicinity that I know of.

"I should appreciate very much having a reply from you in regard to this, and if it has occurred in other sections of the country."

Bloating from white clover is not uncommon in some sections of the country. This is especially true when the clover is wet. Sweet clover does not poison under ordinary circumstances.

Developments in Veterinary Parasitology During the Past Fifteen Years

By Maurice C. Hall

Prophylaxis

An outstanding case of successful prophylaxis for parasitism is that of the swine sanitary system developed by Ransom, Raffensperger and their co-workers in the Bureau of Animal Industry and commonly known as the McLean County System. This system, based on the life history of the swine ascarid, has been used for over 3 years in raising thousands of pigs yearly and has been very successful. Some of the persons using this system, who formerly averaged only about 3 pigs raised per litter, are now raising 7 pigs to a litter. The system consists simply in cleaning the farrowing pens, scrubbing the sow, removing the pigs within 10 days after farrowing to a field sown with forage crops and not used by pigs since it was sown, and keeping them there with clean water, proper food, shade and shelter until they are at least 4 months old. This system has been found more or less protective against "bull nose," "pig typhoid," mange, hog cholera and other diseases, in addition to verminous infestations, as was to be expected from the application of sanitary measures.

The so-called McLean County system has served to direct attention very definitely to the existing high infant mortality among livestock and to point to the value of sanitation, with all that implies as regards cleanliness, proper feeding and good surroundings, in preventing such extensive losses among young animals. It shows that young animals should be given special care and attention and that these measures will be paid for in the great increase in the number of animals reaching a profitable maturity.

In the case of worms having a simple life history, such as ascarids, sanitation is evidently a matter of primary importance, though special measures are indicated in special cases. Thus in the case of the kidney worm, the passage of the eggs of the worms in the urine points to the hog wallow as a particular source of infection, and the abandonment of wallows, or at least the use of concrete wallows frequently cleaned and containing such chemicals as may be used with safety to kill the worm larvae, is one indicated control measure. The use of slat floors to allow the urine to run through is another device that may be used.

In the case of the monoxenous nematodes commonly present in a host more or less immune and in another host highly susceptible, the situation calls for a separation of such hosts. Thus in the case of the poultry gapeworm, occurring in turkeys at all ages and usually not very injurious, but occurring in chickens only when they are young and then highly pathogenic for them, one obvious control measure, as Ransom has pointed out, is to keep young chicks away from turkeys and from areas occupied by them.

In the case of Trichinella spiralis we have a monoxenous nematode with the general habits of a heteroxenous nematode, the primary host serving also as the secondary host and the parasite being transmitted by a suitable host animal eating the preceding host animal. Sanitation in the customary restricted sense of the word is not prophylactic for trichinosis except as better general sanitation is likely to involve less frequent devouring of dead hogs by other hogs, which together with the practice of feeding offal to swine, is probably the most important factor in the spread of trichinosis in hogs. Nor is a very common prophylactic measure for the control of heteroxenous nematodes, the destruc-

tion of the intermediate hosts, feasible, as the hosts which convey the parasite to man are domesticated animals used as food. The situation is very similar to those in the case of beef and pork measles—the parasite must be destroyed and the flesh of the food animal serving as a host must be salvaged if possible and if consistent with the safety of the consumer.

This is a problem in meat inspection, and in passing it may be said that meat inspection is one of the great prophylactic agencies for the control of parasitic diseases. It may also be noted that the recrudescence of meat inspection, after its lapse into practical disuse, followed from the recognition of the importance of parasites after Kuechenmeister's demonstration of the transmission of Taenia solium from measly pork. The destruction by tanking of diseased meat terminates the career of many parasites, a fact emphasized by Ostertag in connection with T. solium and hydatid. It has been the writer's observation that the previously common dog tapeworm, Taenia hydatigena, is apparently becoming scarcer in the United States wherever there are records for a number of years, possibly as the result of more general and better meat inspection. The present meat inspection system of the federal Bureau of Animal Industry is largely a development of the past 15 years, being based on the act of 1906.

Some highly important developments in meat inspection procedure during the past 15 years are due to the work of Ransom and his collaborators. Following the first reports by Ransom (1914; 1915) of his work on the destructive effects of cold upon trichinae, Schmidt, Ponomarer and Savalier (1915) reported that trichinae were killed when subjected to a temperature of 15° below zero C. for an adequate period, and Ransom in an extended series of experiments, the details of which were published in 1916, showed that exposure of infested meat to this temperature for 20 days was ample to insure the destruction of the trichinae, the larvae becoming incapable of infecting animals susceptible to trichinosis in about 10 days and showing irreversible alterations in the protoplasm, apparently in the nature of a separation of colloids from the protoplasm. Ransom and Schwartz found that trichinae were quickly killed by a temperature of 55° C., gradually attained, and the present regulations of the bureau call for a temperature of 137° F. (58.33°C.) as the minimum temperature to which pork and pork products must be heated in order to kill trichinae. Ransom, Schwartz and Raffensperger have studied the curing processes used in curing meat and have ascertained the effective combinations of salt, temperature and drying necessary to kill trichinae. In Germany the projection trichinoscope appears to be extensively used, but the American methods of preventing trichinosis, considering the food customs of the American people, give generally good results, better than would probably be the case if German methods were used, and with the growth of the federal inspection and its more general extension still better results may be expected.

In connection with beef measles Ransom has reinvestigated the effects of low temperatures and arrived at the conclusion that beef carcasses lightly infested with beef cysticerci (Cysticercus bovis) may be kept at a temperature not higher than 15° C. for 6 days and then used for food with entire safety, a procedure distinctly cheaper under certain conditions than refrigeration for 21 days in ordinary cold storage.

As regards the heteroxenous nematodes, prophylaxis is as a rule definitely indicated from the life history, the usual indicated measures consisting of the exclusion of the primary host from areas in which the secondary host occurs, the destruction of the secondary host, and similar measures. Thus the life history of species of Habronema with larval stages in the house fly calls for fly control, and this in turn calls, among other things, for suitable disposal of manure. The prevention of cutaneous habronemiasis and habronemic conjunctivitis calls for the protection of wounds and abrasions and of the eyes from flies. The control of Dermatobia hominis, carried by mosquitoes, evidently calls for mosquito control. It is unnecessary to range through the long list of filarid and spirurid worms and point out the possible lines of attack on intermediate hosts.

Along this line, however, it may be noted that Chandler has advocated a method of snail control for the control of liver flukes, consisting in the use of copper sulphate added to standing water or streams in amounts of 1 part copper sulphate to 1 million parts water. This has been tested in England and reported on favorably. Elsewhere writers have advocated caution in the use of copper sulphate in this manner on the ground of its danger to fish and other desirable animals. For the control of bilharziasis Leiper has recommended that unfiltered water be held 48 hours, in which time the cercariae die, or heated to 50° C., or treated with chlorinated lime or other chemicals lethal

to the cercariae. Owing to the cutaneous mode of infection, one must use equal care with all water for bathing to prevent such infestation.

The demand for control measures for ox warbles deserves notice in a paper of this sort and the work of Imes and Schneider on the use of wading tanks containing a coal-tar creosote is very promising. The use of dipping tanks for tick eradication also seems to have some controlling effect on warble infestation. The squeezing of warbles from the backs of cattle and the destruction of such warbles is a system which is being practiced more or less extensively and it has recently been reported by Carpenter and Hewitt that ox warbles had been eradicated from the 400 to over 500 cattle living on Clare Island, Ireland, by the method of removal by squeezing. The work was begun in 1915 and completed by 1920.

A quite modern development in the field of prophylaxis for parasitism is the use of moving pictures to educate people in control measures. The Bureau of Animal Industry film, "Exit Ascaris," has been extensively shown over the United States and Canada and the International Health Board film, "Unhooking the Hookworm," has been shown in many countries.

Technical versus Practical Work

It must be clear from the foregoing that practical results of great importance to veterinary medicine have been obtained during the past 15 years in the field of parasitology. It should also be clear that these practical results are very definitely based on purely scientific investigations and are valuable in proportion as the scientific basis on which they rest is sound. The seemingly academic investigations are essential to practical results. It may be noted that the American veterinarian realizes this at present to an extent that he did not realize it 15 years ago. The subject of parasitology as a science receives more consideration from veterinarians and from veterinary students and faculties than it formerly did, and will receive yet further consideration. In this connection it should be said that much of the efficiency of veterinary research in America is due to the index catalogues of medical and veterinary zoology of Stiles and Hassall, work of a purely academic nature which has put this country in the forefront in the matter of catalogues and indices as an aid to work in parasitology and made possible more effective research and teaching.

THE PREVENTION OF HEMORRHAGIC SEPTICEMIA

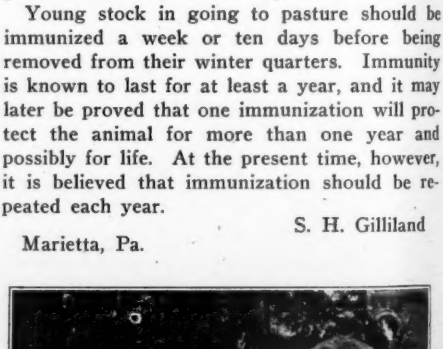
Hemorrhagic septicemia in domesticated animals has caused tremendous losses during the past few years, and many of the deaths in shipped animals, or among the animals with which the shipped animals have been brought in contact, which were diagnosed pneumonia, were from hemorrhagic septicemia. The losses have been so great from this disease that the shippers and stock yard companies have taken it into their hands to purchase large quantities of hemorrhagic septicemia bacterin, through the veterinarian in charge, for the immunization of their animals which were already enroute. Their confidence in the product was so great that they preferred to use it even if the animal had already been exposed. Many times the exposure had taken place so early that the animal was coming down with the disease when the immunizing dose was given, and then the animal died unless serum was used. The serum is a specific.

During the last year the government has supplied thousands of doses of hemorrhagic septicemia vaccine with most gratifying results, and the time may come when it will be required that all animals susceptible to hemorrhagic septicemia be immunized before any inter-territory or state movement of such animals can take place.

Young stock in going to pasture should be immunized a week or ten days before being removed from their winter quarters. Immunity is known to last for at least a year, and it may later be proved that one immunization will protect the animal for more than one year and possibly for life. At the present time, however, it is believed that immunization should be repeated each year.

S. H. Gilliland

Marietta, Pa.



Subject of Cesarean Section in the practice of Dr. L. W. Marner, Wellman, Iowa. Photo taken about a month following operation.

Investigations and Reports on Buttermilk

By W. N. Cochran, D. V. M., Chicago

During the past several months I have been working on the value of buttermilk as a food and medicinal agent for domestic animals. Not so much the why's and wherefore's but the logical thing which is **results.** I find one of the investigators, Dr. A. de Clairmont, describes buttermilk as the "food of the gods." His work has been along the line of Mechnikoff's bacteria therapy and in his investigations he has demonstrated that one glass of buttermilk will benefit the body for fully six weeks after partaking. In other words, the lactic acid organisms in buttermilk will show traces in the alimentary canal for six weeks thereafter, doing their work of fighting and destroying the bacteria of decomposition. He has also found motile bacteria living in the blood of adults, which do not exist in the blood of buttermilk drinkers and which disappear entirely from the blood after a few weeks of buttermilk drinking.

The following recent experiment bears out the above findings. The blood of garbage fed rats was examined and found to contain various bacteria. These same rats were placed on cultures of bacillus acidophilus and three days later the blood was again examined and found to be free of bacteria. They were again fed garbage and the blood remained free of bacteria for a period of three weeks.

Poultry fatteners began feeding buttermilk about ten years ago with the purpose of getting quicker gains and more tender, juicy meat. They found that by adding buttermilk to the rations during the feeding period or in the transportation of live car shipments the mortality was so decreased that this saving alone went a long way toward paying for the buttermilk consumed, and not only this but the poultry when dressed and ready for market, remained high in quality for a longer period of time, indicating that the bacteria of decomposition were held in check. It is practically impossible to find a poultry fattener who does not feed buttermilk liberally.

A certain serum plant reported that during the fall of 1922 they were unable to get more than ten per cent of their tests off satisfactorily. They began feeding semi-solid buttermilk to their test pigs in dilutions of one part semi-solid to thirty parts water, each pig receiving approximately one gallon of the mixture morning and evening. Their tests in a short time increased to ninety per cent. Before trying buttermilk they had tried various agents, including bacterins, vaccines, and copper sulphate in the drinking water with no apparent benefit.

They also found semi-solid buttermilk a valuable agent when used a period of time before and after vaccination or hyper-immunization and these conclusions are based on a period of years of results and experiments. The sales manager for a certain live stock insurance company reported that over a period of years 45% of their hog losses were due to necrotic enteritis. Can you think of anything that would be of more value in necrotic enteritis or other digestive infections than to withhold the food for a period of time and put them on a buttermilk diet, which is easily digested, and through the acid forming bacteria contained in wholesome buttermilk change the reaction of the contents of the intestinal tract to where the bacteria of decomposition cannot grow or multiply?

All the veterinarians I have called upon, as well as the hog or poultry raisers themselves, who have tried the above, are pleased and endorse buttermilk just as the physician does in stomach ulcers and bowel trouble in children. The use of buttermilk does not represent an added expense to the hog raiser or the serum maker, but gives one hundred per cent accounting for itself from a feeding standpoint alone.

Of course, the buttermilk must be properly handled to be effective. It must be free from tuberculosis germs. It must carry plenty of lactic acid forming bacteria. Not any old slop from a creamery will turn the trick. It is this stale, stinking, carelessly handled buttermilk that has obscured the tremendous value of buttermilk when properly handled.

If your local supplies of buttermilk are of doubtful value and not always available, condensed buttermilk can be had from firms whose product is especially made for and advertised to the profession.

USE OF THE STOMACH TUBE

I wish to write about a case I had August 5th, which represents a number of similar cases I have in my practice but for which so far I have been unable to find a satisfactory treatment, since almost all terminate fatally.

An eleven-year-old gelding had been removed from pasture five days previously, fed liberally on new wheat hay and put to work in the harvest field, which is not very strenuous work this year with ten bushels to the acre. The animal appeared all right on the evening of August 4th, but on the morning of August 5th he was sick. The owner gave him a pint of linseed oil, but as there was no relief he sent for me about 11 a. m. When I arrived I found the horse suffering severely with symptoms of gastric engorgement. The pulse was 90-100 per minute, still strong but full; conjunctiva injected; posterior bowels empty and no peristalsis noticeable. When I passed the stomach tube, it struck a solid mass as it entered the stomach. I went to work trying to wash out some of the solid feed but got no return flow. I finally pumped in as much as twelve gallons of tepid water before I gave up the attempt, and I feared all the time that I might rupture the stomach. However, I had hopes that since I could not wash any solid material through the tube, some of it might be washed into the intestines by means of the water. I closed my treatment by giving a large amount of linseed and castor oil, some anodynes and a large dose of nux vomica. I stayed with the horse for six hours, but there was no change in the symptoms and no relief or passage from the bowels. At 9 o'clock that night I was told over the telephone that the horse was relieved, and I knew then that the stomach was ruptured and I would hold a postmortem examination the following day.

Postmortem examination revealed a ruptured stomach and the remainder filled with chewed solid wheat hay. Also the sternal flexures of the large colon were impacted with solid feed. The water I had pumped in had passed through the stomach into the small intestines, but none had passed the impacted mass in the large colon, and neither had it washed any of the impacted mass with it as it passed through the stomach.

Now, if today I had a similar case, I would not know how to treat it any differently, and that is the reason I am making the inquiry. I have used the stomach tube during my five years of practice and have passed it on several hundred horses with little difficulty, but yet so far, I am not sure that one recovery was due directly to the use of the stomach tube. Two times I have had a return flow on inserting the tube, and several gallons of sour-smelling fluid material returned through the tube, and the horses were relieved temporarily. At other times I have been able to get a return flow after pumping in several gallons of water, but in most cases I cannot get a return flow, even after pumping in as much as sixteen gallons of tepid water, and in no case have I yet been able to wash out solid hay or grain. I find the tube, however, a convenient method of administering bulky medicine, and in many cases I get a free escape of gas from the stomach through the tube, and I know that one case of cecal impaction recovered after pumping in sixteen gallons of water two days in succession.

Some writers make us believe that with the aid of the stomach tube they get almost 100 per cent recoveries, but such has not been my experience. Perhaps there is something the matter with my method or my tube. I use a Cahill's tube, a single tube, and easily passed, as the large size prevents it from going into the trachea. Would a double stomach tube do what the single tube will not do?—O. W. J.

Reply: With regard to the case in the horse that you mention, impaction from overloading by wheat has always been regarded as the most serious of impactions in horses, and even where recovery occurs, as being more likely to cause a severe laminitis than any other.

With regard to the use of the stomach tube, your experience scarcely accords with the results that the average practitioner is having from it. In the first place, you are not using nearly enough water. Water should be used simply in quantities sufficient. This may and frequently does require fifty gallons before it will return from the stomach clear. If you will use water from a fountain head of not more than three feet, you will not rupture the stomach, and if you keep the stomach tube open, the time will come when the water will return through the tube regularly. If it is run in and run out enough, in time almost any stomach content will be softened and washed out. Again, the doughy mass which results from engorgement by wheat and your animal probably obtained at least a fair quantity of grain, is one of the most difficult to wash out in this way.

An impacted mass in the large colon is, of course, quite prone to terminate fatally, and an impacted cecum is almost certain to. Still,

by frequent injections of large quantities of water in the stomach and copious rectal enemas, something may often be accomplished. The judicious(and it must be judicious) use of the quick-acting cathartics such as strychnin and arecolin in small doses will add to the injections referred to.

In the use of the stomach tube, it is by no means always sufficient to empty the stomach of a foul smelling mass as you describe, a single time. If, after temporary relief there is a return of distress, it is frequently due to a refilling of the stomach from antiperistalsis and requires to be siphoned out with the tube just as in the first place. Cases have been observed where the stomach filled in this way four times and had to be washed out apparently clear five times altogether, and the cases recovered.

From your inquiry, we judge that your trouble in the use of the stomach tube is in not using it enough. The double stomach tube, that is, one with an inflow and an outflow in the same tube, possesses some advantage over the single tube, but very effective results can be obtained from the latter.

FATAL CASE OF RABIES IN MAN

The following item is from a local paper:

"Michael Lott, 66 years old, of 47 Frederick street, Hackensack, victim of hydrophobia, is dead. He died Sunday night at 9:15 o'clock at Bergen Pines after every effort had been made to save his life. He died quietly."

This is my fourth report of a case of fatal human rabies in spite of the Pasteur treatment. The victim, who is one of my clients, was bitten July 20th, on the front and back of the forearm (radius). The bites were deep and probably touched some nerves.

The dog's head was sent to a laboratory where a positive diagnosis of rabies was made. Treatment began on the third day after the patient was bitten and was continued until completed.

Symptoms of rabies first appeared on Thursday, August 28th. The man was taken to the county hospital where he died Sunday evening, August 31st.

A resolution was adopted by the Hackensack Board of Health on August 13th, this year, making it necessary for the submission of a certificate of canine anti-rabies vaccination before permission could be granted to the dog owner to allow his animal to roam at large.

I. Rubenfeld

Hackensack, N. J.

LEGAL REQUIREMENTS FOR TICK ERADICATION

Ticks cannot be eradicated or controlled by legislative enactment, and yet, without sane and sensible legislation ticks are rarely ever eradicated. If mere legislative acts, regulations by board or resolution by the people could, within themselves, eradicate the tick—tick eradication would have been completed years ago.

There is only one sure, unfailing formula for tick eradication, that is, to dip every cow in a standard arsenical solution every fourteen days, for from fourteen to sixteen successive dippings, beginning in April. This simple formula will produce 100 per cent results.

When any community fails to complete tick eradication in one season, the cattle were not all dipped as outlined in the above formula or tick infested cattle, horses, or mules from infested areas were permitted to re-infest the working area.

The greatest single factor detrimental to the early completion of tick eradication is cheap politics. Cheap politicians love to defend the tick because she makes a burning campaign issue which, properly manipulated, fairly sizzles. When ticks are eradicated this issue is even politically dead. No community or people would for a moment consider re-infestation of their cattle with ticks after the work is once completed.

There is only one place to eradicate the tick, that is on the farm or range where cattle are tick infested. Every man can free his cattle from ticks—if he wants to. No man ought to have the privilege to harbor and perpetuate a serious, infectious disease among his cattle.

A few years ago many people bought and sold tuberculous cattle. Today such practice is universally condemned. Traffic in tick infested cattle is tolerated only because it affects many people in a large area.

Tick infestation, from an economic viewpoint, is as detrimental to the cattle industry of the South as is foot-and-mouth disease to European herds.

When conducted on a business basis, the cost of tick eradication is a mere bagatel as compared with its economic advantages. Impregnated with political thunder and expediencies, it is a costly, long drawn out controversy.

A law prohibiting the movement of tick infested cattle anywhere or for any purpose, requiring state livestock sanitary officials to quarantine and hold in quarantine, for fourteen days and two official dippings, at the owner's expense, any cattle, horses or mules found in-

fested with cattle fever ticks, would speedily complete tick eradication in any state providing fearless and efficient officers were charged with the enforcement of such law.

Good laws poorly administered are worthless. Poor laws efficiently administered will bring results, be amended or repealed.

A working, efficient tick-eradication law must be based on the established life cycle of the cattle fever tick.

Peter F. Bahnsen
State Veterinarian of Georgia

LAMENESS IN SHEEP

While eating supper a farmer telephoned me to hurry out and see his lambs before it got dark, giving the information that they were "foundered." Upon arrival at the client's farm a little after sundown, I found fifteen head out of a flock of fifty standing around humped up, heads hanging down and looking quite full in both flanks, not much inclination to move, but when forced, grunted at every step. A few questions brought forth the information that the day before the lambs were introduced to a self-feeder filled with new oats; also a rain a few days previous had started the clover in a new seeding to which they had free access. This and the fact that several were very lame in either a front or hind foot convinced me that the farmer was about right, and in his own language, the lambs were "foundered."

While helping the owner to drive the flock out of the pasture and away from the oats, I was advised that the lambs had been lame at different intervals all summer. This aroused my interest; so we caught a lame one and found on examination a small round opening in the center, front side of the foot just above the claws, about the size of a small match head, out of which I squeezed a dark colored, foul smelling liquid. Further examination revealed that all four feet were affected in the same way, but the animal was lame only in one foot. We then proceeded to examine some of the others and found the same condition present in the lame ones but not in those that were not lame. It having become dark by this time, further examination was postponed.

This is a new one on me and I thought I would read up, but do not find any description that fits this condition in any text that I have. If anyone can enlighten me as to what this is from the description given, the cause and prognosis, I shall be very grateful.

F. M. McConnell

Litchfield, Mich.

PHOTOGRAPHY OF FOOT-AND-MOUTH DISEASE ORGANISMS

Under the heading, "Photography of the Invisible," the scientific correspondent of The London Times contributed the following article to his paper, as quoted in The Veterinary Record, July 19th:

"Two Dutch investigators, Professors Paul Frosch and H. Dahmen, have succeeded in isolating the virus of foot-and-mouth disease, the virulent contagious malady of cattle which in recent years has broken through our protective cordon and threatened economic disaster to the stock-raising industry of this country. It has long been accepted that the causative agent of this plague must be a living organism capable of surviving outside the body of cattle for a sufficient time to spread by unknown ways. It has been equally clear, however, that it belonged to the little-known group of 'filter-passers,' organisms so minute as to be inseparable from a liquid containing them by a Pasteur filter.

"The identification of a living virus and the possibility of making a pure culture from it are almost essential stages in developing methods of protection or of cure. In the absence of such exact knowledge the means of the transference of infection and the efficacy of treatment by sera or by drugs can only be empirical guesswork. The Dutch professors now have not only isolated the virus, but have been able to make pure cultures of it on solid media. Thus the first stage towards conquest of the disease has been reached. The method they have employed has been the use of the ultra-microscope and the taking of photographs by light-rays beyond the range of visibility. There can be little doubt that they have shown the way towards a method of research of the utmost value in many obscure diseases.

"Many of the objects which have to be investigated by biologists are almost invisible under the microscope, either because of their minute size or because they have almost the same refractive index as the fluids in which they are examined. One device for overcoming this difficulty is the use of pigments or other chemicals chosen so as to produce differentiating effects on the objects in the microscopic field. Another method, sometimes erroneously described as 'ultra-microscopic,' is the use of a dark background with strong lateral illumination. It was by this method that Metchnikov and his associates first made visible the transparent spiral organism of syphilis.

"Dust particles, completely invisible under ordinary light, become clearly visible in a beam of sunlight, as we have all seen when a ray passes through a chink in the shutters of a darkened room. The late Lord Rayleigh was the real inventor of ultra-microscopy when, in 1899, he showed that only sufficiently intense illumination was required to make visible a particle too small to be seen by the highest power of the microscope. The wave lengths of the visible parts of the spectrum lie approximately between 700 and 400 'microns' (millionths of a metre), and any object smaller than about half the wave length of the light by which it is illuminated cannot be seen in its true form and size because of diffraction. Very much smaller particles, however, can be made visible in the form of diffraction images larger in size and different in shape by being observed in a powerful beam of light sent through the solution containing them at right angles to the axis of the microscope. The first satisfactory assemblage of apparatus for this purpose was contrived by Siedentopf and Zsigmony early this century, and modifications and adaptations of this are sold by various optical firms.

"The ultra-microscope can be used to detect the presence and estimate the quantities of particles in a fluid which otherwise would be invisible. It is possible even by elaborate calculation to estimate the true size of the particles. But a still more interesting step was made in 1904 by Kohler, who took photographs by using the short waves of ultra-violet light. Certain structures in cells and apparently some of the 'filter-passers' are transparent to all visible wave lengths of light, but are more or less opaque to ultra-violet rays to which the photographic plate is sensitive. It is this method, hitherto little used because of the complexity of the apparatus required, that Frosch and Dahmen have now developed. Frosch used an ultra-microscope constructed at Jena by Kohler. He obtained the ultra-violet light by burning cadmium in a high-tension electric spark. The cadmium light, passed through a quartz prism, formed a spectrum with a narrow zone of visible light in the yellow and green-blue parts and a very wide zone in the invisible ultra-violet region. These invisible rays were focused by a lens of quartz glass and conducted to the ultra-microscope.

"As the light was invisible, the ordinary methods of focusing could not be employed, and success was obtained only by making a long series of trials until the proper adjustment was reached by the method of trial and error. According to the Dutch correspondent of the Lancet, satisfactory results were obtained first with the causative organism of pleuro-pneumonia, which was found to be not one of the bacteria, but a yeast-like organism propagating by budding.

"The virus of foot-and-mouth disease, grown on a solid medium, gave rise to colonies from seven to eight microns in diameter. With high magnification and the use of light of the shortest possible wave length, it was found possible to get photographs of individuals of the organism, which proved to be bacteria with an estimated length of about one-tenth of a micron. Sub-cultures to the 26th generation have been obtained and proved to retain their virulence.

"Knowledge of the nature and cause of a disease is not necessarily immediately followed by the discovery of a cure, but it is a great advance towards it, and the Dutch success should lighten the work of Sir Charles Sherrington's committee on foot-and-mouth disease."

CESAREAN SECTION IN COWS

In performing cesarean section on cows should one separate the fibers of the external and internal oblique muscles and thus make a cross incision, or should one make a straight incision through all the muscles? I have tried the former method and had trouble in making the incision large enough to deliver the calf through it. I have also tried the latter method and had trouble with the intestine coming out, although the cow was under profound anesthesia. Should one use silk or catgut for suturing the uterus and continuous or interrupted sutures?—O. W. J.

Reply: The textbooks on surgery generally state that the incision is to be made lengthwise of the muscular fibers, but this, as you have experienced, causes some difficulty in delivering the fetus. We believe that in practice generally very little attention is paid to this. The incision is made high in the flank where the abdominal walls are thin and is made straight through from the skin to the peritoneum. If the animal is covered with a clean sheet having a slit or opening corresponding to the incision there is no harm done by some of the intestines pushing out through the incision. This can be lessened by using a trocar on the left side and thus permitting the escape of gas from the rumen before the operation is performed.

We are inclined to think that little or no harm would result from the use of silk in suturing the uterus, but the textbooks recom-

mend, and certainly there would be advantages in the use of, chromicized gut, which, if the sutures do not, as they should not, go through the mucous membrane, will last a sufficient time to permit healing of the wound in the uterus. It is important, of course, that they be placed close together and that the peritoneal surfaces be tightly approximated.

TREATMENT OF NAVEL ILL

I have been a reader of Veterinary Medicine for over thirteen years and have always enjoyed it. I have often been tempted to take part in the discussions, and when I read an article on navel infection in the August issue, signed by H. G. H. and the reply was that there was nothing to add to his treatment, I thought I would give my views on the subject as treating navel ill happens to be a hobby of mine and I have had good success.

I just located here last fall, and this year I have had only three cases, winning out in two cases, after a very unfavorable prognosis. Last year I encountered no cases. The year before I had seven and my treatment was successful in five. The year previous I had eight cases with recovery in six. My banner year was one wherein I treated 34 cases of navel ill and won out in thirty.

If I have any hope of a case yielding to treatment, I simply throw the colt, restrain and cut off the navel cord within about one-half to one-fourth inch from the abdominal wall. Using a probe, I find the direction of the opening, which here in the west has always been backward, except in three cases where the umbilical vein was also infected. Then I insert my blunt pointed curved bistoury into the opening in the navel and make a slit backward at least one and one-fourth inches. The pus is evacuated and a curette used to clean up with, often probing with the forceps to see if I can pick out any more dead tissue.

After this I cleanse with boracic acid solution and have the client cleanse the wound twice a day with the same solution. Internally I give a purge of aloes and follow up four times a day with dram doses of fluid extract of echinacea in a little water, given as a drench. In 15 to 20 minutes the following prescription is given:

Quinin sulphate
Potassium acetate aa 10 to 12 grs.

I usually prescribe, sending two ounces of echinacea and sixteen powders, and often have to repeat.

This is the treatment I have used for eleven years. I have varied the disinfectant, but find boracic acid the safest. Only in a few cases have I used bacterins. Personally I am satisfied the colt has the infection when it is born.

W. Eason, V. S., B. V. Sc.

Watrous, Sask.

NECROTIC ENTERITIS IN PIGS

I wish to ask about a disease in pigs that I have run across in my practice. As nearly as I can describe the disease, it is very similar to Johne's disease in cattle. Young pigs weighing between 65 and 75 pounds, doing well, all of a sudden develop a severe and persistent diarrhea and then rapidly decline in health and finally die in about a week or ten days. Postmortem examination shows thickened portions of the bowels with the mucous membrane thrown into folds giving it a corrugated appearance. The lungs are atelectatic in the ventral portion of the anterior lobes, showing a slight pneumonia. There were no worms present.—H. L. K.

Reply by A. T. Kinsley: Thus far there has been no description of a disease in swine corresponding to Johne's disease in cattle. The symptoms and lesions you have mentioned characterize a condition ordinarily designated as infectious necrotic enteritis. This condition is relatively common in swine and has been designated as chronic hog cholera, mixed infection and necrobacillosis. It is most common in pigs weighing 50 to 75 pounds, although it may occur in swine of any age or size. The specific cause of the condition has not been identified, and it seems probable that it is the result of a combination of bacterial invaders, of which the hog cholera bacillus or B. suipestifer, colon bacillus and paratyphoid B are the most frequent offenders and therefore important factors.

The symptoms of this malady are variable, and the manifestations may not be proportional to the intensity and extent of lesions. The disease may be chronic, slow going and attract little attention, or it may be relatively acute and terminate fatally in a short time. Usually the first symptoms noted are depression, dullness, diminished appetite, digestive derangement and diarrhea. As the disease progresses, the animals become unthrifty and have rough coats and arched backs. Temperature rarely exceeds 105 degrees F., and the affected animals may be subnormal.

The principal postmortem findings consist of lesions usually near the ileocecal valve, although lesions may be found in any portion of the di-

gestive tube. The affected mucous membrane in the beginning is tumefied and later an adherent, tenacious exudate is noted. In some cases the entire intestinal wall appears thickened and friable, due to the accumulated inflammatory and connective tissue. In the prolonged cases, so-called "button ulcers" are prone to occur, this indicating involvement of the solitary follicles or Peyer's patches. Lesions elsewhere in the body are of secondary importance as this disease is particularly confined to the mucosa of the digestive tube.

Treatment is of little avail in those cases that have advanced and extensive lesions. In the earlier stages, the use of mixed bacterin and a liquid diet, particularly a diet containing sour milk or buttermilk, is of considerable value.

DEFICIENCY DISEASE WITH COMPLICATIONS

I should like some information regarding the death of some pigs. I was called on July 1st to see a litter of pigs ten weeks old. They had all been in the best of health until two days before I was called. I found three of them in the following condition:

No appetite, temperature normal, weak in the hind quarters and unable to stand, seeming to have no control of their legs.

I immediately put them on a mineral diet and wormed them, as they had not been wormed. I also specified that they be given plenty of clean, fresh water and ordered the pens cleaned and whitewashed. As the pigs were being fed slop from the hotels, I stopped that, and put them on a bran diet, also ordered that sour milk be given. Things went along well for several days and the pigs seemed to be doing fine.

But in a few days I was called again and found three more pigs down and in the same condition as the first lot, and two of the first lot were worse. Then, on the 15th, two died, and on the 18th, three more were dead, and on the 19th, two more died. I held a postmortem examination and in each I found the following conditions:

Stomach empty but in an inflamed condition, full of red pimples; no pustules nor any other abnormality that I could notice. The bowels were empty, not inflamed and seemed normal. However, I found the liver in a half rotted condition and the lights were congested.

The pigs would eat until the last, that is, just a little, then they would die with apparently no pain. The owner suspected that poison had been put in their feed, but I found no symptoms that indicated poisoning.—C. W. C.

Reply by A. T. Kinsley: From the description, it is apparent that in the beginning or on July 1st, when the first call was made to investigate the pigs, they were suffering from some dietary or deficiency disease. The description of the symptoms that prevailed at that time substantiates the theory that the pigs were probably receiving a diet deficient in mineral salts.

The further findings in this lot of pigs on the second visit were probably due to some other disturbance entirely foreign to that which existed at the first visit. No report is given of the temperature findings at the second visit, but it is very probable that there was some infection occurring as a secondary or a sequel of the primary condition observed on July 1st.

The condition described as occurring in the liver was probably due to parasites, although such disturbance may be produced by bacterial infection.

It is suggested that if the pigs have not already been immunized against cholera, it should be done promptly as such hogs will be quite susceptible to that malady. There is, of course, a possibility of some other infection causing the fatal illness. But it is not believed that the pigs in question have been poisoned. As a matter of fact, it is rather difficult to fatally poison swine.

COPPER SULPHATE IN WATERING TANKS

Could you tell me the possibility of horses being poisoned by copper sulphate when used in watering tanks? How about when a lead pipe leads to the tank? Is it better than potassium permanganate used in this way? I recommend it to a farmer, but some of his neighbors informed him it would poison horses and they recommend potassium permanganate. Copper sulphate keeps the moss out while the permanganate doesn't.—A. H. W.

Reply: Copper sulphate in the very dilute solution required to prevent the growth of algae in drinking water is not harmful to horses, nor to people for that matter, and is frequently used for that purpose. It is stated that copper sulphate will purify the water if used in solution one part to five million. It is frequently used in drinking water for chickens for the prevention of cholera in solution up to one per cent. Lead pipe will not be affected by nor affect water containing so dilute a solution of copper sulphate.

INFECTIOUS ABORTION OF SWINE INCREASING

The increasing number of inquiries relative to abortion in swine received during the spring farrowing period of 1924 suggests that abortion disease is spreading. Since the infectious type of abortion in swine was recognized in Illinois herds in 1920, the disease has been reported in several localities of the state. Swine breeders are seeking advice on this important disease. Veterinary practitioners are in a position to inform their clients and supply reliable information on the control of this infectious disease. Keep breeders advised of the danger of introducing abortion in their herds.—Animal Pathology Exchange, University of Illinois.

GOITER IN PUPPIES

I have a litter of Airedale pups (four) that have a good sized goiter affecting each one. They are seven weeks old, just coming under my attention. The swellings are the size of a hen's egg on each side. There was one more pup in this same litter which we immediately destroyed as it was affected with rickets as well as goiter. Is there hope of success in the treatment of the four pups mentioned?—A. L. S.

Reply: The puppies mentioned should respond readily to treatment, which as you know, for goiter is iodin. Some think that results are more prompt if the iodin is administered in the form of a thyroid extract, tablets of which are available on the market. Personally we are not sure that one form of iodin has any advantage over another. The thyroid tablets or potassium iodid or even the tincture given alone or in the feed, is ordinarily promptly effective in puppies of this age and in cases no worse than those described.

Bear in mind, however, that rickets and goiter are frequently associated, and particularly have a care for it in this instance where one of the puppies has already shown symptoms of rickets. The puppies now in your possession are probably similarly affected but not yet to a noticeable degree, so include a treatment for that. If the puppies are not yet weaned, treat the mother also.

The treatment for rickets is good hygiene and sanitation, exercise in the open air and plenty of sunshine, together with a proper diet and cod liver oil until all the symptoms of rickets have disappeared. Do not overlook the fact that "proper diet" for all dogs until they are grown includes meat, and raw meat is much to be preferred to cooked. Where the puppies are suckling, the mother should have meat. When they begin to eat, raw meat should be a part of their diet—hamburger steak in small amounts is convenient and very satisfactory.

PROPHYLACTIC INOCULATION OF DOGS AGAINST RABIES

The statistical evidence of the efficiency of the prophylactic treatment of rabies in persons bitten by rabid animals has long been too convincing to permit of doubt by reasoning people, however unconvincing it still remains to some with zoophilic or antimedical sentiments. Some Japanese observations on the prophylactic treatment of dog communities may be of interest to medical readers and acceptable to those who place animal life first in value. There is much rabies in Japan and Umeno of the Kitasato Institute of Tokyo sought to reduce it by universal prophylactic immunization of the dog population, using a specially prepared and relatively active virus for this purpose. This has been applied as far as possible since 1919 in Tokyo, and since 1918 in Yokohama, about two-thirds of the dogs in these communities having been immunized. Figures are available to 1922, during which time there occurred forty-one cases of rabies in inoculated dogs, as against 1,699 cases in about half as many dogs in the same communities which were not inoculated. As a large proportion of the forty-one cases arose so soon after inoculation that they antedated the development of an immune condition, it is evident that this method of prophylaxis is highly effective and a valuable weapon in those communities in which rabies is frequent.—Journal of the American Medical Association.

PRURITUS CUTANEUS IN A DOG

A very valuable fur dog, eight or nine years old, in good condition, has an itchy back, will lie down and roll and rub, sometimes howling and continually snatching or biting as much of his back as he can reach. The hair does not come out much, no mange, just a continual itching. This condition has existed for over two years but has not been so severe as it is now. It becomes worse in hot weather. I should be very glad to have some suggestion as to cause and treatment.—G. L. C.

Reply: If by thorough examination you have eliminated parasites from consideration as the cause of the itching and if there is no exudate or matting of the hair such as would have occurred after this length of time even in the

mildest form of eczema, the condition may, with fair certainty, be called pruritis cutaneus, an affection that is fairly common in old, fat dogs and is not rare in marasmic dogs.

However, from your description, the dog scarcely falls in either class, and we should be inclined to look for the cause in improper care of the skin. A fairly common cause of such itching is diabetes mellitus. A mild but chronic indigestion will also cause it. However, the long period during which it has existed would incline to the belief that it is not due to diabetes.

Treatment would consist of attention to the diet, digestive tonics, clean sleeping quarters, clipping and for temporary relief of itching, a bath in a two per cent solution of sodium carbonate (washing soda); or with less trouble, the solution might be used considerable stronger than this and applied freely to the itching parts as often as may be necessary to control the itching.

"FRIGHT DISEASE" IN DOGS

About two weeks ago, I was called to see a pack of six hounds that had been sick for some two months. At the outset, there were nine, three having died before I was called. The history is that the veterinarian who treated these animals earlier gave them distemper medicines and each animal that succumbed died in convulsions. At this time there is no fever. All are eating well, but first one, then another, will show hysteria. They appear frightened, bark, crouch, tail between legs, and finally become more or less exhausted, but there are no convulsions. One animal died two or three days ago. Somewhere I read in Veterinary Medicine a report and treatment of some dogs similarly affected. I have them on cod liver oil, meat and aspirin, with attention to the bowels as indicated.—R. C. J.

Reply: Presumably you refer to what has been termed "fright disease," concerning which mention has been made a number of times in Veterinary Medicine. Probably the article you refer to is the one appearing on page 1024 of the November 1923 issue. The conditions you describe are by no means unusual in distemper in puppies. The fact that these dogs are manifesting nervous symptoms after all other symptoms of distemper have passed, is by no means unusual, and we should not attribute it to the treatment of your predecessor on the case.

There is little to be added to your treatment. It seems to be the one indicated under the circumstances described, except as a sedative we should prefer barbital to aspirin. The prognosis for the five remaining puppies should be good, and on the whole the owner will not have been unfortunate if he saves five out of the nine hound puppies from an attack of distemper in which marked nervous symptoms were shown.

TORTICOLLIS IN PUPPY

I have a four-months-old Fox Terrier pup that went wrong about two months ago. His neck is drawn to one side. He can straighten it or turn it either way, but at other times it is held to the side. It seems to give him no pain whatever. I thought of ear trouble when it first came on but now believe it is a paralysis of the muscles of the opposite side of the neck. Can you give me any information on this, as I have never seen a case of it and can find no literature on it? Do you think it will be permanent?—P. F. S.

Reply: Although you do not mention it, the case described reads very much like a sequel of distemper, and if such is the case, in a dog of this age the prognosis is far from hopeless. The treatment would be stimulative—strychnin, iron and cod liver oil. The diet should be looked into. Puppies of this age need some raw meat and should have it every day.

Should the condition be the result of traumatic injury to the muscles or nerves of what you speak of as the opposite side of the neck, considering the time the condition has existed, the prognosis is not so good, and if some improvement is not manifested in the next thirty days, or ninety days after the probable injury, there is little chance of ultimate recovery.

One should be able to eliminate the possibility of ear trouble after this length of time by examination and we assume you have done so. It is suggested that you give some thought to habit as a cause of this. You know, of course, that slight injuries to the feet will often cause a dog to form the habit of limping and to continue this for weeks after recovery from the injury that started it. This condition and its remedy was discussed in the June issue of Veterinary Medicine on page 388.

If you cannot discover any other cause for this puppy turning its head to one side, try some sort of an appliance that will prevent him from doing it, and possibly after three or four days, he will forget to do it, and the appliance may be dispensed with. In the meantime take another look at his ear.

EAR CANKER IN RABBITS

One of the many serious chronic diseases of rabbits that may interfere with the use of this animal in laboratory work is "ear canker." This disease may seriously handicap or cripple research, especially experiments requiring months or years of observation on the same animals.

Ear canker is caused by an animal parasite (Psorocoptes cuniculi) which closely resembles the mite (Sarcoptes cuniculi) causing scabies. Curiously, it attacks only the concha of the ear. The earliest manifestations of infection are indicated by hyperemia and the formation of reddish brown crusts near the bottom of the concha. The hyperemia and crust formation extend and after months may involve nearly all the inner surface of the ear. The most serious complication of the disease is pyogenic infection of the middle ear which may extend to the internal ear and meninges. The parasite spreads more rapidly during the warm months. The disease is widespread, and few, if any, laboratories escape its occasional introduction.

The usual methods prescribed for treatment involve isolation and are elaborate and costly. For many years we have been treating the infection in important animals by the time-honored plan of removing the crusts and swabbing the concha with glycerine containing 2 per cent carbolic acid. This method, as with many others of the same type, is tedious and time consuming. Last June (1923) when the laboratory was heavily stocked an extensive outbreak occurred, both in the old and the young stock. In casting about for some quick means of attack, we decided to try kerosene on account of its powerful insecticidal action. This was sprayed into the ear with a small De Vilbiss atomizer. Each ear received the amount of kerosene spray discharged from three or four compressions of the bulb or sufficient to moisten only the inner surface of the ear. The ears were sprayed twice, with an interval of six days. At the end of two weeks all the rabbits were cured of the infection and no case has since developed in our rabbit colony, averaging about 200 animals. It is doubtful whether the second spraying was necessary.

We have been prompted to call the attention of other laboratory workers to this well-known infection for the following reasons: (1) This experience was one of the most striking therapeutic effects in mammals we have ever witnessed; (2) Kerosene spray affords a specific, cheap, simple, rapid and certain means, both of curing and preventing the disease.—David Marine, Montefiore Hospital, New York, in "Science," August 15, 1924.

THE SITE OF ACTION OF BOTULINUS TOXIN

Among the striking features that have attracted attention to botulinus poisoning are the unexpected distribution of the bacteria that are responsible for the disease, the subtle ways in which the disease is developed, and the almost unbelievable minuteness of the dose of toxin responsible for the most severe manifestations. The earlier assumption that the poison acts directly on the central nervous system was based largely on histologic evidence, which has become a matter of contradiction and dispute as the knowledge of the effects of botulism has been extended. In a careful reinvestigation of the subject at the Rockefeller Institute for Medical Research, Cowdry and Nicholson have noted that, except for a slight degree of vascular engorgement, all the brain lesions noted in animals suffering from botulinus poisoning are readily susceptible of some explanation other than that they are produced by the direct action of the toxin on the central nervous system.—Journal A. M. A.

IMPORTANCE OF GREEN FEED FOR POULTRY

Exercise, range and proper feed are three of the cardinal points of health and vigor. Only strong, livable chicks can be produced from such hens and males. Of these three items named, proper food heads the list. The "Old Timey" poultryman thought it was necessary for the breeding birds to get outdoors and get their feet on the ground in order that the eggs would be fertile and hatchable. But science works backward. We empirically find things out and what to do, and it remains for later years and sometimes decades to give us the analyses. We now know that it was not the fact that the hen got her feet on the ground that made her lay fertile eggs capable of hatching strong, livable chicks, but that the feed she obtained while running on range had something that was lacking from the indoor feed. We can now put our finger on the spot and say that this something is fat soluble vitamin D, which is essential for fertility and hatchability of the egg and the utilization in the body of phosphates of lime, so essential in bones and other parts. That lime and phosphate may be present in the body, but if this particular vita-

min is not present these essential chemicals cannot be used and the result will be failure. This fat soluble D our feathered friends secure from green feeds, as collards, cabbage, rape; clovers, as red clover, and alfalfa, spinach and sprouted oats, but the sprouted oats should be allowed to grow three or four inches high and become green for the best results. This essential vitamin is also found in other green feeds and to a less extent in root crops, as mangles, turnips and rutabagas.

Another vitamin is that of fat soluble A. If the bird does not receive this vital element in its feed, its eyes become sore, the bird becomes weak, poorly feathered, unthrifty, and finally dies. The fowls get this substance from green feed along with vitamin D.—B. F. Kaupp.

LEGAL ASPECTS OF MILK CONTROL

On few public health subjects is there such a unanimity of opinion by courts of last resort as on milk control. Almost without exception the highest courts in thirty or more states and the United States have upheld the regulation of milk as proper and reasonable.

The regulation of milk and milk supplies has been repeatedly upheld as a valid exercise of the police power. The police power is the inherent power of the state to enact laws, within constitutional limitations, to promote public safety, health, morals, comfort and welfare. The delegation of the power of control over milk to boards of health has likewise often been upheld. The fixing of standards of milk has also been held, in a long line of court decisions, to be a proper function of health authorities. The United States Supreme Court has so decreed in several cases. Regulation of the inspection of dairies and of cattle is valid, according to such decisions. The tuberculin test has been supported by nearly a score of cases.

Adulteration of milk has been taken up by the courts in numerous instances, and there are probably more cases on this phase of the subject than any other. As with the fixing of standards, prevention of adulteration and penalties for it have always been upheld. The United States Supreme Court passed on the matter in the so-called "filled milk" case, Hebe Co. v. Shaw.

The licensing of milk dealers, dairies, and sellers has been pronounced valid. Such licensing must not be discriminating, however, as the requirement of licenses only from the owners of milk vehicles. Taking samples for analysis is not considered as evidence against self. Impure milk or that handled contrary to regulation may be destroyed in a summary manner as a nuisance. Proper receptacles, such as sealed bottles, may legitimately be required, as well as special labels. Pasteurization or certification requirements have been upheld in five notable cases, although they have arisen in only four states, viz. Illinois, New York, North Carolina and Wisconsin.—Public Health Reports.

CHICKEN LICE AND MITES

Lice and mites are very harmful to chickens. They not only hinder egg production but also lower the vitality of the birds so they are more susceptible to colds, roup, and many other diseases.

Since their eradication or complete control is a simple, inexpensive procedure, the presence of lice on the chickens or of mites in the chicken house indicates neglect or indifference.

Sodium fluorid, 1 ounce to each gallon of luke-warm water used as a dip, is the most effective lice killer. Its application is simple and inexpensive.

Complete eradication of lice from the flock requires that every bird be treated.

Mites are killed by spraying the house, particularly the roosting and nesting quarters, with an oil of some kind. The oil from auto crank case thinned with kerosene is satisfactory.—Monthly Bulletin, Ohio Experiment Station.

FOWL CHOLERA

Among the poultry diseases responsible for losses in Nebraska, the one known as fowl cholera deserves first place. This is evident from the fact that in thirty per cent of all the poultry specimens received by the Department of Animal Pathology and Hygiene the presence of fowl cholera could be demonstrated by bacteriologic methods.

Fowl cholera occurs as an acute, communicable disease and as such is due to a micro-organism and this is the sole cause of the disease. This micro-organism is distributed throughout the body of acutely sick fowls in a general way; thus the disease germs abound in the circulation of the blood and the tissues of the body are teeming with them.

While fowl cholera probably causes the greatest ravages among the common farm yard fowls, geese and ducks are also particularly susceptible and turkeys, pigeons and guinea fowls take the disease readily. The common sparrow and other flying birds are liable to the

infection and this should be especially remembered when we attempt to explain the transmission of the disease to isolated farm yards.—L. Van Es.

INTERNAL PARASITES OF POULTRY

The exact importance of intestinal parasites in poultry raising has never been satisfactorily determined. Autopsies reveal what appears to be paradoxical conditions. Frequently autopsies of healthy birds in good flesh will reveal a considerable number of intestinal parasites, which have apparently not caused the host a great deal of physical harm. In many cases, however, birds become thin, do poorly and finally die. On autopsy intestinal parasites may not be more numerous than in other specimens yet no other cause of ill health can be found, and the parasites must be considered as etiological factors. Again we find that birds heavily infested with parasites become much more susceptible to other diseases. With these things in mind we feel justified in making the statement that intestinal parasites are directly or indirectly responsible for probably more than fifty per cent of poultry losses. In growing birds heavy losses are directly traceable to parasitism.

Internal parasites are very prevalent in Missouri poultry. Few autopsies are conducted in which some intestinal parasites are not found. During the past year worms of the genera Capillaria and Spiroptera have been particularly prevalent on autopsies. The ascarids hold a very high rank while the tenia are much less frequently encountered.

The identification of parasites should be attempted as accurately as possible. The class and genera of most parasites can usually be recognized without special equipment. The correct species placement becomes much more difficult. The importance of identification of species has not been particularly emphasized, but it is probably of greater importance than is ordinarily realized. It is possible that the species of worms present may be of greater importance than the actual number.

The fact that intestinal parasites are practically omnipresent demonstrates the loss poultrymen are exposed to when proper yard management is not employed. It also demonstrates the danger of infecting the yards from purchased stock. A few intestinal worms in some birds one year will mean a great many more worms in practically every bird within a very few years.

Practically all the nematodes infesting poultry are thought to have no intermediate host. Eggs passed with the droppings of the host develop in a few days, if the soil and conditions are favorable, into the infective larval stage. These eggs picked up by the same bird or other birds in the flock finally hatch in the intestinal tract to develop into mature worms. The cycle goes on indefinitely if it is not purposely broken.

Cestodes require an intermediate host. It has been shown by parasitologists that various species of snails, slugs, worms and flies are the intermediate hosts of fowl tapeworms. A great deal of work needs to be done to settle the many uncertainties which now prevail in regard to poultry cestode life histories.

Protozoa, with the possible exception of Ameba meleagridis, are transmitted direct from host to host.

Nematode and cestode eggs are well adapted to survive unfavorable conditions and may remain viable in the soil for long periods of time. Protozoa pass through resistant stages of development which enable them to survive unfavorable periods. Dissemination and transmission may therefore take place within a wide range of time.—Sivert Erickson, Missouri State Poultry Experiment Station.

FOWL TUBERCULOSIS SOURCE OF TUBERCULOSIS IN SWINE

Field observations by Federal veterinary inspectors support the belief of research workers that tuberculosis in poultry is an important source of similar infection among swine. A report submitted to the Bureau of Animal Industry, United States Department of Agriculture, by Dr. Ralph Graham, one of its inspectors, is of particular interest because it indicates how easily avian tuberculosis can be detected.

Inspection of the premises where the hogs originated showed that none of the cattle were infected and that no dairy products from any public creamery had been fed to the swine.

With this possible source of infection eliminated the veterinarians turned their attention to the poultry. Slaughter of a few suspicious looking fowls revealed the presence of avian tuberculosis.

This was the case on more than two-thirds of the premises visited. It is believed by the veterinarians making the inspections that avian tuberculosis could have been located on virtually all of the places visited if it had not been for the practice followed by some of the farmers of killing all chickens that appeared unthrifty.

The Army Station Meat and Dairy Hygiene Service

By Capt. Geo. H. Koon

When food supplies offered for the use of troops are rejected because their use would constitute a menace to health, the station veterinarian should endeavor to secure the consent of the owner to denature or destroy them; in case consent is secured he should see that they are properly disposed of. If the owner refuses his consent, indicating a purpose to dispose of the unsound product elsewhere, the veterinary officer, through the commanding officer, notifies the local health authorities and, if proper disposition can not be obtained by this method, recommendation is made to the commanding officer that permission to supply meats and meat food products to the troops be made contingent upon the proper inspection and disposition of articles condemned as unfit for food by the veterinary officer. In order that the purpose of inspections may not be defeated, the exclusion of the troops from public eating places should be recommended whenever such places purchase or serve supplies which have not been properly inspected or which fail to meet inspection requirements.

The station veterinarian inspects the dairies, including collecting depots and creameries, and the herds of those dealers proposing to supply the troops, and makes in writing to the commanding officer such recommendations as are deemed proper regarding their suitability. Subsequent inspections are made at least once every month, and should the veterinary officer consider it advisable for any sanitary reason to discontinue a source of supply, he so recommends in writing to the commanding officer, through the surgeon, giving a full statement of the sanitary defects and the efforts which have been made to correct them. A statement of conditions and of the recommendations and action taken thereon appears in the monthly report of meat and dairy hygiene. Dairy inspection procedures are in conformity with Army Regulations.

The veterinary officer should remember that in connection with inspections made outside of a military reservation he may make recommendations for changes which he may find necessary, but that military authority competent to direct such corrective measures is usually lacking. If the owner or manager of an establishment or dairy does not at any time permit of a proper inspection or fails to comply with the reasonable and necessary veterinary requirements, the veterinary officer recommends to the commanding officer the exclusion of the products thereof from the command.

Occasions may arise when a more or less unsatisfactory supply must be accepted if the article in question is to be obtained at all. Likewise supplies derived from extensive or widely scattered sources, of which the Army consumes a relatively small part, may result in a situation wherein veterinary inspection at the source is manifestly impracticable and recommendations based on such inspections would in any event receive scant consideration from the civilian operators. In each case the station veterinarian in meeting inspection requirements must carefully consider all the various factors entering into the situation. Co-operation by civilians can often be obtained through the use of tact and good judgment. Frequently much reliance must be placed on the character of federal, state, and municipal inspections; and the veterinary officer should keep in close touch with the officials making such inspections and be familiar at all times with the standards which they maintain. In every case the object should be to obtain the highest possible degree of correct sanitation under existing circumstances.

The hygienic condition of milk depends largely upon the conditions existing at the source of supply. Unsanitary milk due to contamination at the source is thereafter correctible only in part; hence it is important that the milk shall come from healthy cows and that it shall be handled in a sanitary manner.

Pasteurization has undoubted value in lowering numerical bacterial counts but it is only a partial remedy for contamination at the source; therefore pasteurization of a milk supply in no wise relieves the veterinary service from the necessity for inspection at the source. Laboratory reports of the bacterial count of milk samples may guide the veterinary officer in determining whether or not a particular dairy shall be recommended as an approved source of milk supply, and it is desirable that samples

of milk be collected at the dairy and bacterial counts made to aid in determining sanitary conditions at that point, but bacterial counts of milk samples taken after delivery to the station can not be considered as meeting dairy inspection requirements.

The veterinarian of every camp, post, depot, or other station or separate command keeps a daily record on Form 110, M. D., of all meats, meat food and dairy products and forage inspected, showing (1) class of inspection and kind of product, (2) pounds passed, (3) pounds rejected, and (4) necessary explanatory remarks. On the first day of each month veterinary officers charged with making meat and dairy inspections, prepare a report on Form 110, M. D., covering all inspections made during the preceding month and submit it, through the surgeon, to the commanding officer. A like report is made of forage inspected at time of first receipt for purchase and is forwarded as an insert to Form 110. The whole report comprises data relative to meats, meat food and dairy products and forage inspected, followed by a record of sanitary conditions observed during the month, shown in the following order: First, establishments previously approved and serving as sources of supply; second, new establishments; third, dairies previously approved and supplying the troops; fourth, new dairies; and fifth, recommendations submitted.

This is a very brief outline of the veterinary meat and dairy hygiene and forage inspection service of the Army and ends the account of the peace time service of Army veterinarians. A study of what has been written will, it is believed, materially aid veterinary Reserve and National Guard officers to a more complete understanding of the service in a theater of operations, to be described in future numbers.

VETERINARY OFFICERS AT CARLISLE BARRACKS

The two weeks' training from July 7th to July 21st, at the M. O. R. C., at Carlisle Barracks, Pa., was pronounced, by the 400 officers who attended, a most decided success.

Owing to the destruction of the barracks at the Carlisle School on June 15th, by fire, the student officers were tented in field hospital tents arranged in three companies, A, B, and C. All of these were very enthusiastic over the lectures and demonstration courses and are eagerly looking forward to future camps.

The veterinary officers had a get-together dinner at the Hotel Carlisle in town, after which they enjoyed an instructive talk by Capt. G. H. Koon, the senior veterinary representative of the Army at the camp, and also by Capt. Clell B. Perkins, also of the regular Army, and Major J. P. Lowe and Capt. F. G. Lillyman, both of the O. R. C.

The pleasure of a gathering at the camp was heightened by the renewal of old acquaintances, Major Mason, having served with Capt. Lillyman at Ft. Reno, Okla., and Capt. Koon and Perkins having been Division Veterinarians of the 90th Division in the A. E. F., to which Capt. Lillyman was assigned.

The details as far as planned, at that time, of the mobilization to take place Sept. 12th, were gone into thoroughly.

Standing, left to right: Capt. F. G. Lillyman, 2nd Lieuts. C. B. Denman, A. J. Ringlein. Sitting, left to right: Chaplain Kanther, Capt. Harry Fenkel, Capt. Clell Perkins, 1st Lieut. L. W. France, Major J. P. Lowe. On the ground, Capt. F. G. Kneup, 2nd Lieut. G. B. Hartke.